This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

614.0979
W4
D4

THE BIENNIAL REPORT

B 49709 1 A

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF WEST VIRGINIA,

FOR THE YEARS 1887 AND 1888.

CHARLESTON:
MOSES W. DONNALLY, PUBLIC PRINTER.
1889.

Digitized by Google

MEMBERS OF THE BOARD.

First Congressional District.

WM. M. LATE, M. D., BRIDGEPORT.

GEORGE T. GARRISON, M. D., WHEELING.

Second Congressional District.

C. L. RICHARDSON, M. D. CHARLESTOWN.

N. D. BAKER, M. D., *Secretary*, MARTINSBURG.

Third Congressional District.

GABRIEL McDONALD, M. D., UNION.

W. P. EWING, M. D., *President*, CHARLESTON

Fourth Congressional District.

A. R. BARBEE, M. D., POINT PLEASANT.

B. H. HOYT, M. D., RAVENSWOOD.

Digitized by Google

REPORT OF SECRETARY.

MARTINSBURG, W. VA., Dec. 31st, 1888.

To HON. E. WILLIS WILSON,

Governor of the State of West Virginia:

SIR: In compliance with the law establishing a State Board of Health on regulating the practice of medicine and surgery, I have the honor to present to you the annual report of the State Board for the year 1888:

Reports from local boards of health throughout the State show that with the exception of an epidemic of measles which prevailed in nearly every section of the State in the months of January, February, March and April, we have had an exceptionally healthy year. Scarlet fever, so much dreaded on account of the large mortality usually attending its prevalence, is accredited with but three deaths out of the 2,312 reported to the secretary. Typhoid fever, dyptheria, cerebro-spinal fever and the other symotic diseases, have prevailed to a limited extent, but in no instance amounting to an epidemic. With proper sanitary precautions rigid isolation of the diseases upon their first appearance, it is possible still further to restrict their prevalence. The indications of a small flame will arouse the people to prompt efforts to suppress that which might end in a great conflagration. Millions of money are invested in active experts and most approved implements for checking and suppressing disastrous fires. The epidemic in the same way starts from a small beginning, and unless properly met at the threshold by well-known and yet effectual sanitary measures and confined to one person or one family, it speedily grows to a mighty power, sweeping away whole families, and in some instances nearly whole communities.

An evidence of the advancement of our people in the knowledge of sanitation and its great advantages is their ready ac-

Digitized by Google

quiescence in the rules and regulations of both State and local Boards of Health. We find the citizen as well as the municipality yielding a cheerful obedience to the health laws. Many who formerly were disposed to distrust its benefits are now among its most zealous advocates.

Since the last report to the executive the only change in the Board has been the appointment of Dr. B. H. Hoyt, of the Fourth Congressional District, to the place made vacant by the expiration of the term of Dr. T. A. Harris.

At the annual meeting in July last the Board was reorganized as required by law, Dr. W. P. Ewing, of Charleston, was elected President and Dr. N. D. Baker, of Martinsburg, was elected Secretary.

I desire especially to call your attention to the law relating to "Intinerant physicians and itinerant vendors of patent medicine," the proper enforcement of this statute throughout the State, would bring into the Treasury no small sum, nearly, if not quite as much as the appropriation for all the expenses of the State Board of Health. In the majority of instances through the negligence or ignorance of those whose duty it is to make those collections; the parties, after plying their vocation for a season are allowed to escape, whereby the law is violated and the State defrauded of her rightful revenue. When the appropriation for the expenses of the State Board of Health is under consideration by the Legislature, it would seem nothing more than justice, that the Board should receive due credit for this source of revenue.

The number of local boards of health is at present greater than at any time in the previous history of the State. Local boards have been organized and are actively co-operating with the State Board of Health in every county in the State except Calhoun, Clay, Jefferson, Pendleton, Putnam, Summers and Wetzel. The county courts of these counties having failed to make nominations to the State Board, they are without legally qualified boards of health.

Reports from the health officers of the different counties, in response to a circular from the Secretary asking for reports upon the sanitary condition of the jails, school houses and county Asylums for the poor, show many of our jails to be in bad condition. Prisoners are huddled together in badly ventilated and poorly lighted cells, without any regard to health or comfort, the innocent and the guilty compelled to suffer alike. Few, if any of our jails are supplied with modern conveniences so essential to health.

County houses for the poor are nearly all reported in fair to good condition. The greatest trouble with our school houses appears to be the want of proper heating and ventilation. Building after building is being erected without the least regard to this most important matter. Silently and imperceptably the seeds of disease are sown upon the fertile soil of youth and innocence. A constant supply of pure, warm air should be furnished

Digitized by Google

in the cold months of the year. This could easily be done by a good system of furnaces or by a good heater placed in each room with a cold air duct leading to it from outside, and a foul air register at the floor leading into the ventilating flue. A perfect system of heating and ventilating should keep a school room supplied with pure, warm air without a perceptible current and without the opening necessarily of door or window. No subject should be of greater importance to a people, than the preservation of the lives and health of their children.

The law in relation to the collection of vital and mortuary statistics appears, in some parts, to be ambiguous. Section twenty-nine, page 199, acts of 1887. This section refers to the form of blank to be used by physicians in making returns of births and deaths occurring in their practice to the county clerk. It was the understanding of the State Board of Health that all expenses incurred in the collection and recording of vital and mortuary statistics in each county should be paid for out of the county treasury. The opinion of the Attorney General is adverse to this understanding of the Board. Some of the clerks of county courts acting upon this opinion, have failed to provide for the collection of births and deaths, and give the failure of the State Board to supply them with these blanks as an excuse for their failure to comply with section twenty eight of the same act, which requires them to report to the secretary of the State Board of Health all marriages, births and deaths occurring within their respective counties. To be of value, the report of the registrar of vital statistics should embrace every county in the State.

About the first of August small-pox appeared at Stringtown, a a small village on the Ohio side of the river, opposite Sistersville, in Tyler county. The State Board was promptly notified of the fact. Quarantine was at once established against the infected district by the local board of health of Tyler county, through the advice of the State Board, and the Ohio Board of Health asked to take steps for the suppression of the outbreak. The timely action of the State and local board of health prevented the introduction into our State of this loathsome and much dreaded disease. At the earliest possible moment the quarantine was raised. Small pox has prevailed, more or less extensively, in the States of Pennsylvania, Connecticut, Tennessee and Ohio since the first of the present year, but through the activity of health boards has been restricted to very small areas. Our own State has been particularly fortunate, not having had a single case during the year.

The limited appropriation for the use of the State Board of Health very materially restricts its usefulness. No question should be of more vital importance to the State than the preservation of the lives and health of her citizens. To attain the full measure of its usefulness to the people the State Board of Health should meet at least four times a year, oftener when necessary. With the means at present at the disposal of the Board it is impossible to hold more than the annual meeting without the dan-

Digitized by Google

ger of exceeding the yearly appropriation of $1,500. Questions of importance are constantly arising which have to await a whole year for a solution. More frequent meetings would enhance the value, and increase the interest in sanitary work. There is a vast field of usefulness still within reach of the Board, which we have never been able to cultivate for want of funds. Documents should be constantly on hand for distribution among the people in seasons of epidemics, teaching them the best means of preventing and suppressing outbreaks of typhoid fever, diphtheria, scarlet fever and other symotic diseases. The State should be represented in the "National Conference of State Boards of Health," but our laws make no provision for the expense. The collection of vital statistics has increased the expenses of the State Board fully $400.00 without any increase in the appropriation for the use of the Board, which remains the same as in 1882, when the act was passed. Other States, more particularly those of the Northwest, are making rapid progress in the preservation of the public health, and in stamping out the preventable diseases, why should not West Virginia be in the front ranks.

We sincerely hope the next Legislature may see the necessity for increasing the appropriation of the State Board of Health from $1,500 to $2,500.

It has been the special effort of the Board to direct popular attention to the value of pure water for drinking and culinary purposes, and to impress upon them the danger of using impure water, especially in times of epidemics. It is believed by many persons that running waters are freed by oxidation from all injurious pollution, such as sewage, the dejection of disease, decaying vegitable or animal matter, manure from cultivated lands washed into rivers after periodical rainfalls and the like. But such oxidation has been observed by those who are competent to judge, to be very slow. Disease germs have been known to be carried by polluted waters for many miles unchanged, becoming apparent by their specific injurious effect. It has been approximately ascertained that a flow of 200 miles or more is necessary to free waters by oxidation from the impurities mentioned. Whether these conditions are fulfilled in the case of our rivers may be inferred from their topography, the distance between cities lining their banks, and such other sources mentioned, as more or less action in modifying or polluting water supplies. The true basis for judging of the purity of water is by chemical analysis and microscopical examination. Very precise analytical methods have been devised for ascertaining the mineral constituents of potable water, which are found nearly the same in all, varying in quantity, and unless in excess not injurious to the system, except the rare and usually avoidable metallic contamination, such as that from lead pipe, &c., it is to the quantity, and especially to the quality of the organic matter present in water that its unwholesomeness is due, and to determine this with extreme precision, then, would seem to be of paramount importance.

Digitized by Google

A single and sufficiently delicate test to form an opinion, or to ascertain whether a given specimen of water may be used for drinking or culinary purposes, is a modification of the familiar permanganate of potass test. "W. E. Stobles, of London, found that by adding hydrate of potass. of proper strength to the permanganate the albuminoid matter, which passed unchallenged by the permanganate alone, was thereby brought under its influence. The proportion he recommends are as follows:

Potass. permanganate - - - -	1 p.
Potass. hydrate - - - -	4 p.
Distill water - - - -	160 p.

If a minimum of this solution be added to distilled water in a glass or test tube, the beautiful pink color imparted to the water will remain unchanged for several days. but if similarly applied to water containing the slightest trace of organic matter there will be a brownish precipitate, with loss or entire discharge of the color of the test solution. Numerous comparation experiments have shown that if such reaction takes place within a few hours the quantity of organic matter present is such as to be injurious to health.

The number of persons granted certificates to practice medicine and surgery since the printing of the last report is 168. One hundred and thirty-nine graduates, twenty-seven ten-year practitioners and four examined.

That section of the law allowing certificates to all persons who had practiced medicine in the State ten years continuously prior to 1881, is giving the Board no end of trouble, nearly, if not all entitled to register under this statute, are in possession of certificates, and if not are hardly entitled to recognition at this late day. The Board most earnestly urges the repeal of that portion of the statute relating to practioners of ten years prior to 1881.

I herewith submit the transactions of the State Board of Health for the years 1887-88. The report on vital statistics and certain other papers relating to public health, which I hope you may deem of sufficient importance to publish.

Very respectfully,

N. D. BAKER,
Secretary State Board of Health.

Digitized by Google

FINANCIAL STATEMENT.

OCTOBER 1, 1886, TO SEPTEMBER 31, 1887.

DR. T. A. HARRIS, SECRETARY.

1886.			
Oct.	5, Salary	$	125 00
1887.			
Jan.	4, Salary		125 00
April	5, Salary		125 00
July	28, Postage to date		77 25
	Expense to Pt. Pleasant		9 75
	Expense trip to Charleston, Jan		18 50
	Expense trip to Charleston, July		15 00
	Expressage		3 85
	Salary		125 00
			$624 35

DR. G. I. GARRISON.

1887.			
July	28, Expenses to and from Charleston	$	28 00
	4, Per diem		16 00
			$43 00

DR. G. M'DONALD.

1887.			
July	28, Expenses to Charleston	$	15 25
	4, Per diem		16 00
	Postage, &c		2 75
			$34 00

Digitized by Google

DR. A. R. BARBEE.

1886.			
July	28,	Expenses to Charleston	$ 8 00
		Two days services	8 00
		Postage and expressage	4 75
1887.			
July	28,	Four days attendance	16 00
		Traveling expenses	8 00
			$44 75

DR. C. T. RICHARDSON.

1887.			
uly	28,	Expenses to Charleston	$ 46 00
		Postage, &c	15 00
		Five days attendance	20 00
			$ 81 00

DR. N. D. BAKER.

1887.			
July	28,	Expenses to Charleston	$ 43 00
		Expressage and stamps	6 00
		Five days attendance	20 00
			$ 69 00
		Total	$896 10

Digitized by Google

FINANCIAL STATEMENT.

OCTOBER 1, 1887, TO SEPTEMBER 30, 1888.

Appropriation			$ 1,500 00

DR. T. A. HARRIS.

1887.			
Oct.	4,	Salary as Secretary and Registrar	$ 200 00
1888.			
Jan.	7,	Salary as Secretary and Registrar	200 00
Mch	26,	Postage to date	35 59
		Expressage and telegrams	19 25
		Trip to Charleston	14 50
		Trip to Pt. Pleasant	6 75
		Trip to Martinsburg	18 80
		Expense in Martinsburg	2 50
April	18,	Salary as Secretary and Registrar	200 00
July	21,	Salary as Secretary and Registrar	158 80
		Expenses to Wheeling	17 25
		Expenses to Weston	10 65
		Expenses to Moundsville	6 00
		Expressage and postage	33 20
			$923 29

DR. GEORGE I. GARRISON.

1888.			
Mch	26,	To one day with Dr. Harris	$ 4 00
		To one day investigating hog cholera	4 50
		To one day at Penitentiary	5 25
		To investigating hog cholera	8 80
		To procuring assistance of Dr. Garrison	4 50
		To Furnishing evidence	4 00
		To investigating hog cholera	9 00
		To examing R. Sibly	8 00
		To investigating hog choler	7 12

Digitized by Google

Mch 26,	To securing evidence against Dr. Sibly	4 00
	To expenses and postage to date	10 44
	To expenses to and from Martinsburg	15 00
	To hotel expenses	3 00
	To three days attendance	12 00
July 21,	To expenses	5 60
	To expenses	16 00
	To examination Dr. Freeland	4 00
	To postage	3 50
	To freight, &c	62
	To postage and expressage	2 00
	To telegrams &c	1 81
	To expensse to Charleston	22 85
	To four days attendance	16 00
		$172 99

DR. C. T. RICHARDSON.

1888.		
Mrch 26,	Expenses to Martinsburg	$ 3 90
	Per diem	4 00
	Examination Mr. Haw	4 00
	Postage, &c., to date	5 50
		$17 40

DR. WM. M. LATE.

1888.		
Mrch 26,	Expenses to Martinsburg	$ 17 20
	Three days attendance	12 00
	Examination R. B. Sibly	4 00
	Postage to date	1 60
	Examination P. Freeland	4 00
	Two days meeting at Clarksburg	8 00
July 21,	Five days meeting at Charleston	20 00
	Expenses to Charleston	23 15
	Postage	1 25
		$91 20

DR. N. D. BAKER.

1888.		
Mrch 26,	To Examination Mr. Haw	$ 4 00
	One days service	4 00
	Postage and expressage	4 00
July 21,	Examination Mr. Huff	4 00
	Expenses to Charleston	38 00
	Postage to date	2 40
	Twenty-nine days services as Secretary	64 00
		$120 40

DR. W. P. EWING.

1888.		
Mrch 26,	Expenses to Martinsburg	$ 33 55
	Four days attendance	16 00
21,	Two days Charleston	8 00
	Postage to date	1 50
		$59 05

DR. B. H. HOYT.

1888.		
July 21,	Expenses to Charleston	$ 15 35
	Four days attendance	16 00
		$31 35

Digitized by Google

DR. G. M'DONALD.

1888.			
July	21, Expenses to Charleston	$	18 60
	Four days attendance		16 00
	Postage		75
			$35 85

DR. A. R. BARBEE.

1888.			
July	21, Expenses to Charleston	$	7 40
	Two days attendance		4 00
	Postage, expressage, &c., to date		6 85
			$22 25
	Total, 1888		$1,473 28

Digitized by Google

TRANSACTIONS OF THE BOARD IN SESSION.

The State Board of Health met at its regular annual meeting in Charleston, W. Va., July 11th, 1887. There were present Drs. Richardson (president), Baker, McDonald, Barbee, Garrison and Harris (secretary).

The minutes of the last meeting were read and approved. The secretary then read his report.

SECRETARY'S REPORT.

GENTLEMEN: It is again my agreeable duty to report to the Board no special outbreak of virulent or epidemic disease in the State since our last meeting, one year ago.

I would respectfully call your attention to the fact that the State has not been as free from epidemic and contagious diseases as it should be. Measles, scarlet fever, diphtheria, whooping cough and typhoid fever have prevailed to a certain extent in the State, and this prevalence has not been confined to a small district, but has been more or less general over the State to a much greater extent than should have been the case, and than would have been the case had the value of isolation along with the proper use of disinfectants and other sanitary precautions been properly appreciated and enforced. I am satisfied that no legislation on the subject of health and sanitation will be effective until the people are educated up to a proper appreciation of such measures.

After my return from our last meeting, I wrote the letters directed by the Board to Drs. Bartholow, Iriland and Kinsman, deans of Jefferson Medical College, Philadelphia, Louisville Medical College of Kentucky, and Columbus Medical College of Ohio, respectively, which led to some correspondence which will be found published on pages 23, 24, 25 and 26 in my biennial re-

Digitized by Google

port. Several newspapers published incorrect statements and unfavorable criticisms of the action of the Board in reference to the medical schools above referred to; to this I felt it my duty to reply. I did so, giving a plain statement of the facts. I notified John McCauly that the Board did not complete his examination.

Upon the question of registering the graduates of Columbus Medical College, after the receipt of Dr. Kinsman's letter of July 24, 1886, I submitted the letter of Dr. Kinsman to each member of the Board, with the request that they would indicate their vote on the same, with the following result: In favor of registration, Richardson, Baker, Late, Carr, Wilson, McDonald and Harris, opposed to registration Barbee.

In September I tried to enforce the law against some Indian doctors, as itinerants. They escaped the penalty by claiming to be "vendors of patent medicines," and not itinerant physicians. I found it difficult to get the Prosecuting Attorney to prosecute these cases.

In October I was notified by Dr. L. D. Wilson, that he had resigned his position on the State Board of Health and that his resignation had been accepted by the Governor. Whereupon I wrote the Governor asking him to appoint a successor to Dr. Wilson, latter I learned through the public press that Dr. G. W. Bruce of Moundsville, Marshall county, had been so appointed by the Governor, and still later that Dr. Bruce having declined to qualify the Governor had appointed Dr. G. I. Garrison of Wheeling, to the place.

It has been manifest that our health law needed amendment in several particulars to bring it up to the efficiency of the health laws of several other States. At the last meeting of the legislature I succeeded in getting several amendments passed. 1st. Amending section fifth, making the quarantine provision applicable to diseased stock. 2nd. In changing section sixth so as to remodel the county boards of health, making them less medical in their composition, and adding the president of the county court and the prosecuting attorney of the county to the board, and in providing for payment for their services. 3d. In section ten securing to the State Board the power to refuse and to revoke certificates of physicians for dishonorable or unprofessional conduct. 4th. In section ten to include itinerant venders of patent medicines, &c., under the same provisions as itinerant physicians; and in adding section twenty-one to provide for the free vaccination of the poor. Section 22 requiring prosecuting attorneys to enforce the law, and making them, with the presidents of county courts, members of the local boards.

Sections 23, 24, 25, 26, 27, 28 and 29, establishing a system of vital and mortuary statistics throughout the State, under the control of the State Board of Health, and prescribing the mode and manner of carrying it into effect. The expectation is that by such a system of vital statistics some accurate knowledge will be obtained as to the actual heathfulness of the State and of its differ-

Digitized by Google

ent sections, and also a basis of comparison of present with future conditions of healthfulness, and of the efficiency of any sanitary measures which may be undertaken in the State. The necessary forms for use in this registration have been for some time in the hands of the public printer, by whom they will be sent to the clerks of the different counties, whose duty it is to distribute them to the parties concerned. The Secretary of State kindly authorized the public printer to do this at public expense. Several clerks have inquired whether they should register physicians upon their diplomas. I have replied that they should be registered only upon certificates of the State Board of Health.

Feeling the importance of educating the people in the value of sanitary matters, I went in November to Pt. Pleasant and read in public a paper on the "Cast of Disease," and again in Parkersburg, I read to a School Institute a paper on "Public Hygein." I would respectfully suggest that the different members of the Board should embrace every opportunity of making public and of popularizing this great matter of public sanitation. I had during the winter applications from different parties desiring to know when they could be examined? I fixed the 4th of March as a time when, with Dr. Barber and Dr. Sharp (local officer), an opportunity would be offered those of the Fourth district who might present themselves. The examiners were ready, the candidates did not appear. Dr. Sharp came into town from Volcano expressly for this purpose. I would respectfully ask that the Board allow his expenses for the same.

On the 10th of June I received a letter from Dr. Edward Miller, chairman of the Louisville Medical College, asking when and where we would meet, as his college desired to be represented. I gave him the desired information.

I have had some correspondence with H. F. Asbury, which is herewith submitted.

The correspondence of my office has been large, as is evidenced by the amount of postage charged, all of which has not been spent in letter writing, but partly in distributing the reports of the Board and many sanitary papers throughout the State.

There were registered from July first, 1886, to July first, 1887, thirty-one graduates, four ten year men, total, thirty-five.

The expenses of the Board for the year 1886 was $898.00; for 1885, it was $1,030.06 as shown by the Auditor's report.

The twenty-third section of the amended acts makes is the duty of the Board to fix the salary of the registrar of vital statistics.

Respectfully submitted,

T. A. HARRIS, *Secretary.*

Dr. Garrison presented his credentials and was invited to participate in the proceedings of the Board.

A letter was received from Mr. S. D. Littlepage in relation to the receiving of Prof. T. K. Wiley, of the Baltimore University

Digitized by Google

School of Medicine. Prof. Wiley was received, and spoke in the interest of his school in refutation of certain charges which had been made against the school, and in representing the school as deserving recognition at the hands of the State Board of Health of West Virginia. Dr. Richardson presented letters containing charges against the Baltimore University School of Medicine. The Board decided that the charges against the College were not sustained, and that graduates of the school should be registered by the Board.

Mr. Littlepage appeared before the Board in behalf of H. F. Asbury asking that he be re-examined by the Board. The Board fixed the time for examination of H. F. Asbury.

Dr. McDonald moved that H. F. Asbury be not required to pay a fee of ten dollars for re-examination, he having paid the fee for examination within the last year. Carried.

Dr. Baker moved that the salary of registrar of vital statistics be fixed at three hundred dollars ($300.00) per annum.

Dr. Garrison presented the following resolution:

WHEREAS, The system of drainage in use in that portion of the city of Wheeling, North of Eigth street, is such that all sewage and surface washings are deposited in the Ohio river at various points 1,300 to 4,000 feet above the intake of the water works which supply the city; and

WHEREAS, The proper disposal of the sewage of that portion of the city of Wheeling is of direct interest to the people of that city in its bearing upon the purity of their water supply; and

WHEREAS, The State Board of Health is charged by law with the conservation of the life and health of the citizens of the State, and especially to examine into and advise as to the water supply, drainage and sewage of towns and cities; therefore, be it

Resolved, That the exclusion of the ordinary flow of Janathans ravine, and all the sewers north of Eigth street from the Ohio river north of the water works are essential to the purity of the Wheeling water supply;

Resolved, That this Board deems it of the utmost importance in the interest of the public health that a committee be appointed for the study of the question involved, and the formulation of a comprehensive place for their satisfactory solution, to be reported to this Board at its next meeting;

Resolved, That the Mayor of the city of Wheeling be requested to appoint a committee from the City Council to act in conjunction with the committee of the State Board of Health.

Dr. McDonald offered the following resolution:

WHEREAS, A report that is believed to be authentic has reached the State Board of Health of West Virginia, that the water sup-

Digitized by Google

ply and general sanitary condition of the city of Wheeling is in a most reprehensible and alarming condition; and

WHEREAS, The per centage of sickness and mortality from typhoid fever is reported to be unequaled in any city of the United States and surpassed by but few cities in the world; therefore, be it

Resolved, That the Secretary of this Board be directed to visit the city of Wheeling, as soon as may be convenient and make a thorough investigation of the condition of the water supply and general sanitary condition of the city, and make such recommendations to the city authorities as the exigencies of the case seem to demand, and also that he report his action to this Board.

On motion of Dr. Barbee, the secretary was instructed to visit the Insane Asylum and Peniteutiary and report upon their condition.

H. F. Asbury was examined and passed by the Board, and the secretary ordered to send him a certificate to practice medicine in this State.

Board adjourned to meet again the second Wednesdey in July, 1888.

Digitized by Google

EXTRA MEETING OF THE BOARD.

Pursuant to a call by the president, the State Board of Health met at Martinsburg, Berkeley county, March 21st, 1888. Present, Drs. Richardson, Baker, Ewing, Tate, Garrison and Harris. The president stated that he had called the meeting in consequence of a letter received from the Attorney General in relation to the appointment of county boards of health.

Dr. Tate offered the following resolution, which was passed:

WHEREAS, It has been the custom of this Board to confirm nominations of county courts for local boards of health through its secretary, when there was no known objection to the parties nominated, by sending the various appointees certificates of appointment by its secretary, believing such action to be in conformity with the spirit of the law, but now having the opinion of the Attorney General that such action of appointment should be made by the Board assembled,

Resolved, That we proceed to act upon all nominations now in the hands of the secretaries. Passed.

Nominations from the follwing counties were confirmed: Barbour, Boone, Braxton, Brooke, Cabell, Calhoun, Clay, Doddridge, Fayette, Gilmer, Grant, Greenbrier, Hampshire, Hancock, Hardy, Harrison, Kanawha, Lewis, Lincoln, Logan, Marion, Marshall, Mason, Mercer, Mineral, Monongalia, Monroe, Morgan, Nicholas, Ohio, Pleasants, Preston, Raleigh, Randolph, Ritchie, Roane, Summers, Taylor, Tucker, Tyler, Upshur, Wayne, Webster, Wetzel, Wirt, Wood, Wyoming.

Dr. Baker moved that all appointments be for two years from date.

There being no further business the Board adjourned.

Digitized by Google

ANNUAL MEETING OF THE STATE BOARD.

State Board of Health met in the Senate Chamber, Charleston, West Virginia, July 17, 1888. Present: Drs. Ewing, McDonald, Late, Hoyt, Barbee, Garrison and Baker.

Minutes of the last meeting were read and, with some slight changes, approved.

Minutes of the meeting held at Martinsburg. March 21st, 1888, read and approved.

SECRETARY'S REPORT.

GENTLEMEN: Once more it is my duty to report to you the transactions of my office for the past year. The year has not been an unhealthy one in our State, though various diseases have prevailed in different parts of the State, but the mortality from all sources is reported as being very slight. Reports received from most of the county boards within the last few weeks, shows the sanitary condition of most of the counties to be good. The jails in quite a number of counties are reported to be in a bad condition, county houses in fair condition, school houses fairly good, but not satisfactory as to mode of ventilation.

Special reports have been secured within the year, from Clay county, on the prevalence of malignant dysentery. Disease among cattle was reported from Mineral, Monongalia, and Marion counties; hog cholera from Ohio and Brooke.

In the reports from county boards the extensive prevalence of the preventable contagious diseases has been a marked feature. Correspondence with health boards and physicians throughout the State shows a marked increase in interest in sanitary matters.

Within the year there have been registered eighty-four graduates, eighteen ten years men, and four by examination. Total, 106.

Digitized by Google

The only money reported as having been received by members of the Board on examinations is Dr. Richardson, $20.00, and Dr. Garrison, $20.00. Total, $40.00, which has been reported to the Auditor as required by law.

Notice was received from the American Public Health Association of the passage of the following resolution:

"As the introduction of contagious diseases into the country through any one port of entry is liable to communicate, not to one port alone, but to the whole country, it would seem that the whole country, through its central representatives in Washington, should have the control and direction of the means of preventing the introduction of such diseases; it is asked that the members of Congress be requested to further such legislation."

At a meeting of the State Board of Health, the following resolutions were adopted:

I. That the conference reaffirms the principles contained in the resolutions adopted at Toronto in 1886.

II. That the communicable diseases herainafter mentioned, prevalent in certain areas, or which tend to spread along certain lines of travel, be reported to all State and Provincial boards within said area or along said lines of travel.

III. That in the instance of small-pox, cholera and yellow fever, reports be at once forwarded either by mail or telegraph, as the urgency of the case may demand; and further, that in the case of dyphtheria, scarlet fever, typhoid fever, anthrox and glanders, weekly reports, when possible, be supplied, in which shall be, as for as known, the places inflicted and the disease of prevalence.

I would state that neither in the conference of State Boards nor in the American Public Health Association is this Board represented, because there is no provision for meeting the expense of such representation. The law in fact prohibiting it when such meeting is held outside the State.

In closing this, my final report, I am constrained to thank the gentlemen of the Board for their uniform kindness and courtesy to me personally, for their patience and forbearance with my many shortcomings as their secretary.

Respectfully submitted,

T. A. HARRIS.

Dr. Barbee moved that the appointment of Dr. Baker, as secretary *pro tem.*, by the president, be confirmed, and that he be allowed the salary of secretary from June the 18th to July the 17th, 1888.

On motion of Dr. Garrison the board proceeded to the election of officers for the ensuing two years. Dr. W. P. Ewing, of Charleston, was elected President by acclamation, and Dr. N. D. Baker, of Martinsburg, was elected Secretary.

Digitized by Google

On motion of Dr. Late, Dr. B. H. Hoyt was put on the Committee on Revision of By-laws in place of Dr. Harris.

Nominations for county boards of health were confirmed for the following counties. viz: Berkeley, Jackson, McDowell and Wyoming.

The nomination of Dr. McKeehan for member of the local board of Harrison was confirmed. In the case of the local board of health for Wetzel the Board decided to confirm the nominations of E. P. Haught and John McComas and to reject that of George K. Franks. The secretary of the Board was instructed by the Board to ask the county court of Wetzel to make a new nomination in the place of George K. Franks.

Dr. Wm. M. Late reported $20.00 received for examinations of candidates and paid into the State treasury. J. Putney and J. H. Hare each paid $10.00 preliminary to their examinations. Total, $40.00.

Dr. Barbee offered the following:

Resolved, That this Board feels deeply sensible of and fully appreciate the eminent services of its late efficient Secretary, Dr. T. A. Harris, whose connection with the Board has terminated by reason of the term for which he was appointed having expired. By his earnest labors much good has resulted to the State, and the Board relieved from much labor and responsibility.

July 18th Board met pursuant to adjournment, at 9 a. m. Present: Drs. Ewing, McDonald, Late, Garrison, Hoyt and Baker.

On motion of Dr. Garrison, the applications of Dr. Burdish ("the White Pilgrim on Wheels") for certificate to practice medicine was taken up. The Board after due investigation decided that he was not entitled to a certificate under the law, and instructed the secretary to notify the applicant to that effect.

Dr. Garrison made the following report of work done by the Board in the First Congressional District:

"Since the meeting of the State Board at Martinsburg the proprietor of a 'system of rectal treatment' has been arrested in Wheeling for violation of section fourteen of the health laws. He spent one night in the county jail and succeeded in procuring a bondsman for his appearance at court. One man was examined for the licentiate of the Board and passed.

"On the 17th of April being apprised that two 'medical fakes' had made their appearance in the city, I ascertained that they were attempting to practice a specialty, and proposed to go through the town in a hurry. They had a supply of remedies with them and their method was to go from house to house, tak-

Digitized by Google

ing both sides of the street at once. I at once took the proper steps for their arrest, but before this could be effected they were apprised of their danger and fled.

In regard to procuring registration of two physicians, both graduates, experienced considerable trouble, but it was due to a misunderstanding of the law on their part.

Since I have been a member of this Board there have been collected from itinerants $100.00 in Ohio county, and $50.00 in Wetzel, yet the State Board is not credited with this and the various sums collected in other portions by other members."

Dr. Garrison read a paper on "the condition of Wheeling's water supply." which on motion of Dr. NcDonald was ordered to be printed in the Transactions of the Board.

Reports of Dr. Harris, former Secretary on the condition of the Penitentiary, Hospital for the Insane and Wheeling's water supply read and ordered to be printed.

The Board proceeded to the examination of James Putney and J. H. Hard. The examination of James Putney proving satisfactory, the Board declared him competent to practice medicine and sursery and ordered the Secretary to send him a certificate. The examination of J. H. Hard not being satisfactory he was rejected.

Dr. McDonald offered the following:

Resolved, That the State Board of Health of West Virginia, hereby tender its thanks to our late President, Dr. C. T. Richardson for his courteous and efficient administration during his term of office.

There being no further business the Board adjourned to meet in Charleston in July, 1889, upon the day fixed by the law, or at the call of the President.

Digitized by Google

LIST OF GRADUATES IN MEDICINE AND SURGERY.

Names.	*Address.*	*College and Date of Graduation.*
Allen, Wm B.	Morgantown	University of Virginia, 1849.
Ackerman, Gregory	Wheeling	University of Berne, 1879.
Andrews, Robt.	Fairview	Cincinnati Col. of Medicine & Surgery, 1881.
Alexander, W R.	Parkersburg	University of New York, 1870.
Arbuckle, J E.	Green Bank	Col. of Physicians and Surgeons, Balt., 1878.
Ayler, J W.	Duffields	Medical College of Virginia, 1884.
Amos, Enos X.	Fairmont	Jefferson Medical College, 1872.
Adams, B F.	Grafton	Washington College, Baltimore, 1877.
Ayler, J W.	Poca	University of Virginia, 1868.
Ackley, Geo K.	Pomeroy, O.	Starling Medical College, 1854.
Ackley, Geo B.	Pomeroy, O.	Starling Medical College, 1880.
Armitage, J Q.	Portland, O.	Eclectic Medical College, Cincinnati, 1876.
Aldrich, E W.	Huntington	Eclectic Medical College, Cincinnati, 1881.
Austin, S H.	Lewisburg	Medical College of Virginia, 1866.
Austin, C N.	Lewisburg	Cleveland Medical College, 1856.
Anderson, G L.	Bellaire, O.	Starling Medical College, Ohio, 1854.
Arnett, J R.	Aurora	Col. of Physicians and Surgeons, Balt., 1882.
Ashby, T A.	Baltimore, Md.	University of Maryland, 1878.
Austin C L.	Green Bank	University of Maryland, 1882.
Atkinson, A.	Baltimore, Md.	
Aultz, A E.	Young's Mills	Col. of Physicians and Surgeons, Balt, 1883
Atkinson, C L C.	Buffalo	Col of Physicians and Surgeons, Balt., 1884.
Anderson, L B.	Norfolk City	Medical Depot, Hampden Sidney Col., 1884.
Ashbrooke, R L.	Calis	Col. of Physicians and Surgeons, Balt, 1887.
Bates, W J.	Wheeling	University of Pennsylvania, 1837.
Bates, W J Jr.	Wheeling	Miami Medical College, 1872.
Baird, Geo.	Wheeling	University of Pennsylvania, 1852.
Baguley, H B.	Wheeling	Medical College of Ohio, 1881.
Birney, T P.	Wheeling	Cin. Col. of Medicine and Surgery, 1879.
Bullard, R H.	Wheeling	Medical College of Ohio, 1877.
Boyce, J M.	Hannibal, O.	Medical College of Ohio, 1878.
Burwell, Philips.	Parkersburg	Washington University, Baltimore, 1872.
Bruce, G W.	Moundsville	University of Pennsylvania, 1848.
Beaumont, G L.	New Cumberland	Eclectic Medical Inst., Cincinnati, 1869,
Bonar, Chas W.	West Liberty	Miami Medical College, 1878.
Brues, Thos.	Wheeling	University of Maryland.
Bradford, P S.	St Marys	Jefferson Medical College. 1855.
Bailey, W J.	Jane Lew	Bellevue Hospital Medical College, 1881.
Bland, W J.	Weston	University of Louisville, 1842.
Bland, B C.	West Union	Kentucky School of Medicine. 1877.

Digitized by Google

Bond, O G	Rockford	Col. of Physicians and Surgeons, Balt.,	1879.
Batson, A F	New Salem	University of Maryland,	1881.
Bowcock, J W	Clarksburg	Jefferson Medical College,	1850.
Bowcock, J W	Clarksburg	Jefferson Medical College,	1879.
Brown, R L P	Morgantown	Jefferson Medical College,	1881.
Boone, J S	Powhattan	Cin. Col. of Medicine and Surgery,	1872.
Bartlett, E P	Marietta, O	Bellevue Medical College.	1875.
Brownson, E S	Peel Tree	Berkshire Medical College,	1859.
Bryan, C P	Academy	Jefferson Medical College,	1855.
Blair, J P	Buckhannon	Cin. Col. Medicine and Surgery,	1861.
Butler, M S	Hedgesville	University of Maryland,	1874.
Beall, Wm	Berkeley Springs	National Medical College (D. C.)	1846.
Buck, T H	Leetown	University of Louisville,	1848.
Baker, N D	Martinsburg	University of Maryland,	1868.
Bates, S A	Middleway	Jefferson Medical College,	1847.
Brown, W W	Kabletown	Washington University, Baltimore,	1873.
Border, D W	Kearneysville	Bellevue Hospital Medical College,	1875.
Butler, C T V S	Shepherdstown	University of Maryland,	1874.
Bzington, F	Charlestown	University of Georgetown (D. C.),	1858.
Brownfield, J H	Fairmont	Jefferson Medical College,	1878.
Barnett, A B	Pruntytown	University of Maryland,	1879.
Brock, L S	Morgantown	Jefferson Medical College,	1874.
Bomberger, G L	Irondale	University of Pennsylvania,	1865.
Boggs, C D	Franklin	Jefferson Medical College,	1859.
Berkley, B F	Romney	Louisville Medical College,	1844.
Butler, G W	Webster	University of Maryland,	1882.
Barbee, A R	Pt. Pleasant	University of Pennsylvania,	1851.
Beckwith, S W	Ravenswood	Miami Medical College,	1878.
Brown, H M	Union	Col. of Physicians and Surgeons,	Balt., 1878.
Barksdale, W L	Union	Jefferson Medical College,	1853.
Barton, C C	Addison, O	Louisville Medical College,	1877.
Beardsley, A J	Huntington	Bellevue Hospital Medical College,	1870.
Buffington, E S	Huntington	Jefferson Medical College,	1872.
Beard, S C	Lewisburg	University of Virginia,	1853.
Blubaugh, C B	Hinton	University of Maryland,	1880.
Butt, A H	Indian Creek	Medical College of Virginia,	1858.
Black, C A	Fire Creek	Vanderbilt University of Tenn.,	1879.
Buyess, G R	Wayne C H	Louisville Medical College,	1872.
Bee, Isaiah	Princton	Cleveland Medical College,	1860.
Baker, Bascam	St. George	Col. of Physicians and Surgeons,	Balt , 1882.
Bowcock, C M	Clarksburg	Jefferson Medical College,	1882.
Bryan, H H	Academy	Jefferson Medical College,	1882.
Bryan, R E	Academy	Jefferson Medical College,	1882.
Bickle, W H	Pt. Pleasant	Col. of Physicians and Surgeons,	Balt., 1882
Beard, W C	Alderean	Vanderbilt University, Tenn.,	1852.
Barber, T L	Charleston	University of Pennsylvania,	1882.
Baird, R M	Wheeling	Harvard University,	1882.
Baillie, N A Jr	Paint Creek	Col. Physicians and Surgeons,	1882.
Brown. L G	Huntington	Eclectric Med. University,	Cincinnati, 1882.
Bishop, J C	Middleport, O	University of Wooster,	1869.
Brown, A C	Huntington	University of Pennsylvania,	1870.
Burdette, J S Jr	Charleston	Medical College of Ohio,	1883.
Bartholow, R	Philadelphia, Penn.	University of Maryland,	1852.
Brinton, J H	Philadelphia, Penn.	Jefferson Medical College,	1852.
Bolton, J W W	Palatine	University of Maryland.	1883.
Blum, R	Wheeling	University Tubingen, Germany,	1849.
Belleville, J E	Wheeling	Boston Univ. sch'l of Med. (Homœ ,)	1883.
Bennett, F M	Hinton	Medical College of Virginia.	
Burns, H A	Frankfort Springs	University of city New York,	1880.
Burwell, W H	Parkersburg	Jefferson Medical College,	1881.
Barker, D H	Revesville	Col. of Physicians and Surgeons,	Balt , 1885.
Banfield, J C	Huntington	Eclectic School of Med. Cincinnati,	1885.
Burchinal, L N	Manington	University of Maryland,	1886.

Digitized by Google

Bowen, W B.....Moorefield.....University of Maryland, 1881.
Burwell, E A.....Morgantown.....Missouri Medical College, 1884.
Bias, M S.....Milton.....Louisville Medical College, 1887.
Barker, G E.....Spencer.....Col of Physicians and Surgeons, Balt., 1887.
Baker, M.....Ft. Gay.....Louisville Medical College, 1887.
Bland, T J.....Martinsburg.....University of Maryland, 1887.
Brannen, H C.....Wheeling.....Hospital Medical College, Ky., 1887.
Baywell, J F.....Parkersburg.....University city of New York, 1880.
Beaumont, F P.....New Cumberland.....Eclectic Med. College of Cincinnati, 1887.
Boon, J A.....Indian Creek.....Bellevue Hospital Medical Col. N Y., 1888.
Blackburn, A M.....Steubenville, O.....Ohio Medical College, 1884.
Ballard, E K.....Oakesville, Berkly Co.....University of Maryland, 1887.
Bantz, E.....Baltimore, Md.....University of Pennsylvania, 1845.
Boyer, C W.....Parkersburg.....Hannemann Medical College, Pa., 1888.
Bruns, W F.....Catlettsburg, Ky.....Eclectic Med. College of Cincinnati, 1888.
Bilt, E O.....Baltimore, Md.....University of Maryland, 1886.
Cracraft, C A.....Triadelphia, W Va.....Philadelphia College of Medicine, 1852.
Campbell, J A.....Wheeling.....Jefferson Medical College, 1874.
Cook, John.....Bridgeport, O.....Starling Medical College, 1865.
Coxe, John H.....West Liberty.....Cincinnati College Med. and Surgery, 1853.
Campbell, Mathew.....Parkersburg.....Winchester, Va Medical College, 1852.
Carter, J T.....Triadelphia.....Medical College of Ohio, 1874.
Conaway, E B.....Ripleys.....Miami Medical College, 1874.
Campbell, T B.....Wheeling.....Eclectic Medical Institute, 1859.
Cracraft, F P.....Triadelphia.....Col. Physicians and Surgeons, Balt, 1877.
Cooper, J M.....Wellsburg.....Medical College of Ohio, 1857.
Camden, T A.....Parkersburg.....Jefferson Medical College, 1854.
Charter, W A.....Lost Creek,.....Washington University, Baltimore, 1869.
Charter, W K.....Lost Creek,.....Washington University, Baltimore, 1869.
Casto, C E T.....Rockport,.....Miami Medical College, 1875.
Carr, A S.....Clarksburg,.....Jefferson Medical College, 1879.
Charter, L K.....West Union,.....Vermont Medical College, 1841.
Curtis, W K.....Wellsburg,.....Jefferson Medical College, 1878.
Christian, E C.....Jacksonville,.....University of Pennsylvania, 1848.
Collins, J W.....Toronto, Ohio,.....Columbus Medical College, 1879.
Christy, J H.....Paris, Penn.,.....Cleveland Medical College, 1876.
Curtis, H W.....Marietta, Ohio,.....Homeopathic Medical Col., New York, 1881.
Colton, J D.....Marietta, Ohio,.....University of Louisville, 1847.
Campbell, M B.....Beverly,.....Medical College of Virginia, 1868.
Carter, J P.....Gerardstown,.....University of Maryland, 1852.
Castleman, H S.....Charlestown,.....College of Phys. and Surg., Baltimore, 1880.
Carter, N H.....Shanghai,.....College of Phys. and Surg., Baltimore, 1878.
Carpenter John.....Martinsburg,.....Eclectic Medical Inst., Cincinnati, 1854.
Carr, L L.....Fairmount,.....Jefferson Medical College, 1876.
Combs, E H.....Morgantown,.....Hahnem Med. College, Philadelphia, 1860.
Coplin, D C.....Boothsville,.....University of Maryland, 1877.
Curry, W C.....Flemington,.....University of Maryland, 1881.
Clayton, J P.....Arnettsville,.....Starling Medical College, 1879.
Cameron, J W.....Newburg,.....Jefferson Medical College, 1848.
Chapman, F.....Keyser,.....Washington University of Baltimore, 1871.
Carpenter, Z H.....Moorefield,.....University of Maryland, 1868.
Cockrell, W S.....Harper's Ferry,.....University of Maryland, 1870.
Campbell, L F.....Pt. Pleasant,.....University of Maryland, 1867.
Carpenter, S P.....Poco,.....University of Pennsylvania, 1858.
Coe, W G.....Blue Sulphur Spri'gs, College of Phys. and Surg., Baltimore, 1877.
Cooper, C S.....Alderson,.....Medical College of Ohio, 1870.
Cromley, J B.....Gallipolis, Ohio,.....Ohio Medical College of Ohio, 1880.
Campbell, W. C.....Walton,.....University of Louisville, 1876.
Comstock, L K.....Charleston,.....Jefferson Medical College, 1860.
Carr, Lawrence.....Charleston,.....Louisville Medical College, 1874.
Cheek, A M.....Charleston,.....Hahnemann Medical College, Illinois, 1872.
Chilton, S B.....St. Albans,.....University of Indiana, 1880.

Digitized by Google

Carpenter, A W.....Charleston,.....College Phys. and Surg., Baltimore, 1875.
Caldwell, W P .....White Sulphur,.....Washington University, Baltimore, 1876.
Chancellor, C W.....Baltimore, Md.,.....Jefferson Medical College, 1852.
Clark, E W.....Westernport,.....Rush Medical College, Illinois, 1871.
Craig, A E.....Arbuckle,.....Louisville Medical College, 1882.
Cummings, W K.....Hampton,.....College Phys. and Surg., Baltimore, 1882.
Crary, A.....Hartford City,..... Starling Medical College, 1883.
Chidester, J W.....New Salem,.....Medical College of Ohio, 1883.
Cooper, J W.....Wellsburg,.....Jefferson Medical College, 1884.
Calvert, A E..... St George,.....Phys. Med. Col. of Indiana, 1884.
Chesney, J W.....Middlebourne,.....College Phys. and Surg., Baltimore, 1884.
Curtis, J S..... Hockingport,.....Cincinnati College of Med. and Surg , 1878.
Campbell, C K.....Sink's Grove,.....College Phys. and Surg., Baltimore, 1885.
Clark, H S.....Washington, Pa.,.....University of Maryland, 1885.
Climer, F L.....Keyser,.....University of Michigan, 1886.
Campbell, H S.....Glenwood,.....Columbus Medical College, 1887.
Cullin, J S D.....Richmond, Va.,.....Medical College of Virginia, 1853.
Campbell, L M.....Wayne C. H.,..... ... College of Phys. and Surg., Baltimore, 1887.
Clayton, J E.....Louisville,..... University of Baltimore, 1887.
Caperton, G H .....Fire Creek,.....University of Pennsylvania, 1854.
Curtis, W K..... .....New Martinsville,... University of Baltimore, 1887.
Carr, A H.....New Hope,.....Louisville Medical College, 1874.
Craig, H F..... .....Glen Elk,.....Baltimore Univ. School of Med., 1888.
Curry, J S.....Petersburg, ...Medical College of Virginia, 1887.
Casto, C.....Belgrove,..... University of Louisville, 1888.
Casto, V L.....Stall's Mill,..... .....University of Louisville, 1888.
Collison, D W.....Baltimore, Md.,.....College Phys and Surg., Baltimore, 1886.
Castiel, D T E.....Buckhannon,.....University of Maryland. 1885.
Chapman, A A .....Bleufield,.....Long Island College Hospital, N. Y., 1871.
Dowler, Albert..... .....Sherrard,.....University of Wooster, 1879.
Dagg, R M.....Dallas ....Cleveland Medical College, 1879.
Dolbeare, L D.....Benwood.....Medical College of Virginia, 1852.
Donehoo, R S.....Fairview .....Jefferson Medical College, 1879.
Doerner, J A.....Cumberland .....University of Maryland, 1877.
Davis, F M..... .....Bedington.....University of Maryland, 1856.
Davis, G A.....Middleway .....College of Phys. and Surgs, Balt., 1880.
Daniels, G W.....Gerardstown .....Cincinnati College Med. and Surg., 1871.
Deck, M B.....Darksville.....University of Maryland, 1879.
Daily, R W.....Romney ....University of Pennsylvania, 1842.
Dunbar, W A .....Winfield ....University of Louisville, 1856.
Dudding, G W.....Hurricane .....Medical Cellege of Ohio, 1867.
Dunlap, J W .....Union.....College Phys. and Surgs., Baltimore, 1877.
Dabney, D W.....Guyandotte .....Cincinnati College of Med. and Surg., 1865.
Digs, D W..... Nicholas C H.....Louisville Medical College, 1876.
Douglas, Walter.....Union ....University of Glasgow, Scotland.
Dunglison, R J. .....Phil, Pa .....Jefferson Medical College, 1856.
Daugnerty, T.....Baltimore, Md ..... University of Maryland.
Davidson, J E..... .....Brighton.....Rush Medical College, Ill., 1883.
Dickey, J L.....Wheeling.....Jefferson Medical College, 1883.
Daniels, J B.....Duffields.....College Phys. and Surg., Baltimore, 1884.
Daily, G T.....Romney .....College Phys. and Surg., Baltimore, 1884.
Deuley, A B.....Kanawha co.....College of Phys. Surg., Baltimore, 1885.
Day, L A L .....Martinsburg.....Pulte (Homeo.) Medical College, 1885.
Davenport, H L.....New Geneva, Pa.,.....Jefferson Medical College, 1875.
Daniels, T L.....Beverly .....Hospt. Medical College of Kentucky, 1885.
Dixon, J A.....Steubenville, O.....Hahna Medical College, Ill., 1884.
Dye, W T W..... .....Smithville,.....Starling Medical College, 1886.
David, A G.....Barboursville.....Kentucky School of Medicine, 1887.
Dickie, W W.....Coopers. .....Medical College of South Carolina, 1857.
Des. Rockers, J B.....Wheeling .....Georgia Col. of Eclectic Med. & Surg., 1887.
Dunbar, D W.....Coopers .....University of Pennsylvania, 1879.
Edwards, T O.....Wheeling.....Medical College of Ohio, 1873.

Digitized by Google

Edmiston, T G	Weston	College Phys. and Surg., Baltimore, 1876.
Evans, A M	Middleway	University of Pennsylvania 1876.
Erwin, J E	Barboursville	Louisville Medical College, 1878.
Ewing, W P	Charleston	Jefferson Medical College, 1846.
Evans, T R	Raleigh C H	Medical College of Virginia, 1877.
Enslow, C R	Wayne C H	Medical College of Ohio, 1877.
Eskie, Leonard	Benwood	University of New York, 1882.
Eddy, C W	Marietta, O	Miami Medical College, 1877.
Edmiston, M J	Weston	College Phys. and Surg , Baltimore, 1884.
Elgin, F	Harper's Ferry	St. Louis Medical College, 1877.
Evans, A J	Lumberport	Starling Medical College, 1885.
Elliott, A B	Bramwell	University of Louisville, 1886.
Edgell, L L	Toll Gate	Starling Medical College, 1885.
Epstein, E M	West Liberty	College Phys. and Surg., New York, 1859.
Elliott, A A	Steubenville, O	University of New York, 1881.
Frissell, J	Wheeling	Berkshire Medical College, Mass., 1834.
Frey, R R	Cranberry	University of Maryland, 1868.
Frame, A N	Parkersburg	Medical College of Indiana, 1879.
Founer, W M	Cameron	Medical College of Ohio, 1879.
Fouke, C F	Charlestown	University of Virginia, 1876.
Frey, W	Brandonville	Universitty of Maryland, 1852.
Fuller, J T	Brandonville	Western Reserve University, Ohio, 1880.
Fundenbury, S H	Romney	Bellevue Hospital Medical College, 1868.
Fravel, E H	Pt. Pleasant	Jefferson Medical College, 1879.
Fisher, E C	Racine, O	University of Michigan, 1872.
Fitch, J P	Morgantown	Bellevue Hospital Medicine College, 1882.
Frissell, C M	Wheeling	College Phys. and Surg., New York, 1882.
Fichtner, A S	Cranesville	College Phys. and Surg., Baltimore, 1882.
Fullerton, J L	Volcano	College Phys. and Surg., Baltimore, 1882.
Fry, F T	Quinnimont	University of Virginia, 1843.
Fricke, A	Phil, Pa	University of Berlin, Penn., 1839.
Frund, L D	Tryconnell	University of Maryland, 1883.
Fisher, B S	Sissonville	College Phys. and Surg., Baltimore, 1884.
Finley, J A	Simpson's Station	University of Maryland, 1884.
Fonner, W H	Wheeling	Jefferson Medical College, 1884.
Forman, L H	Aurora	Col. Physicians and Surgeons, Balt., 1885.
French, M F	Logan C H	Medical College of Virginia, 1884.
Ford, J W	Caldwell	Medical College of Virginia, 1876.
Fitley, R H	Camden	Baltimore University school of Med., 1888.
Fletcher, W J	Eureka, O	Miami Medical College, Ohio, 1880.
Fierz, S V	Martinsburg	University of Maryland, 1888.
Gillespie, J L	Sistersville	University of Virginia, 1857.
Gillespie, W H	Sistersville	Col. Physicians and Surgeons, Balt., 1881.
Glass, M W	Sand Hill	Jefferson Medical College, 1878.
Gall G T	Newport, O	Jefferson Medical College, 1874.
Gittings, Allen	Clarksburg	Col. Physicians and Surgeons, Balt., 1871.
Guthrie, C C	Belpre, O	Cincinnati Col. of Medical Surgery, 1864.
Grantham, G W	Bunker Hill	Medical College of Virginia, 1864.
Grove, R C	Snyder's Mills	National Medical College, D. C., 1873.
Green, C S	Berkeley Springs	University of Pennsylvania, 1872.
Grant, W L	Grafton	Jefferson Medical College, 1856.
Gerstell, F A	Keyser	Uuiversity of Gottengen, Germany, 1841.
Gertsell, Robt	Piedmont	University of Maryland, 1873.
Gerstell, Richard	Keyer	University of Maryland, 1873.
Grove, J B	Petersburg	Bellevue Hospital Medical College, 1878.
Grove, T J	Petersburg	Winchester, Va., Medical College, 1849.
Gamble, H McL	Moorfield	Jefferson Medical College, 1861.
Gardner, J F	Bloomerz	Bellevue Hospital Medical College, 1878.
Grovè, P D	Ronceverte	University of Penn, 1855.
Gates, M A	Ronceverte	Detroit Medical College, 1880.
Guthrie, W B	Gallipolis, O	Medical College of Ohio, 1872.
Gooch. B P	Hinton	Medical College of Virginia, 1879.

Digitized by Google

Grover, T E W	Glenwood	University of Michigan, 1877.
Goff, R E L	Goof's	Starling Medical College, 1882.
Cale, C B	Newport, O	Col. of Physicians and Surgeons, Balt., 1882.
Goodno, C W	Belpre, O	Medical College of Ohio, 1882.
Gaskill, Frank	Ronceverte	Detroit Medical College, 1880.
Garrison, W R	Martin's Ferry	Col. Physicians and Surgeons, Balt, 1888.
Gross, S D	Philadelphia, Pa	Jefferson Medical College, 1828.
Gross, S W	Philadelphia, Pa	Jefferson Medical College, 1857.
Gibson, J G	Shepherdstown	University of Pennsylvania, 1846.
Girard, A. R	Point Pleasant	Col. of Physicians and Surgeons, Balt., 1883.
Garrison, W H	Harper's Ferry	Washington University, Baltimore, 1871.
Gaston, Wm	Jane Lew	Eclectic Medical Institute, 1884.
Grant, W L	Grafton	Starling Medical College, 1885.
Gumm, A S	Shiloh	Col. Physicians and Surgeons, Balt., 1885.
Gerloch, H P	Queen City, O	Medical College of Ohio, 1880.
Ganord, B P	Spring Hill	Col. Physicians and Surgeons, Balt., 1883.
Gall, E D	Phillippi	University of Maryland, 1887.
Gerloch, H P	Crown City, O	Medical College of Ohio, 1880.
Gratogny, L H	Morgantown	Starling Medical College, 1864.
Garrison, G I	Wheeling	Jefferson Medical College, 1886.
Goutner, A M	Wheeling	Jefferson Medical College, 1879.
Goff, J M	Goff's	Starling Medical College, Ohio, 1888.
Greenfield, W T	Middlebourne	Miami Medical College, Ohio, 1883.
Gentry, C C	Hurricane	Col. of Physicians and Surgeons, Balt., 1888.
Glasscock, A B	Grafton	University of Maryland, 1888.
Hoge, Eugene	Wheeling	Long Institute Col. Hospital, 1872.
Harvey, R S	Wheeling	Bellevue Hospital Medical College, 1875.
Hardesty, J R L	Washington, D C	Jefferson Medical College, 1856.
Hazlett, R W	Wheeling	Jefferson Medical College, 1851.
Huff, J C	Wheeling	Jefferson Medical College, 1847.
Hall, J L S	Chicago, Ill	Bennett Medical College, Ills., 1878.
Harris, T A	Parkersburg	University of Virginia, 1854.
Hunt, L C	Parkersburg	Jefferson Medical College, 1871.
Houston, J N	Buler's Station	Jefferson Medical College, 1880.
Harden, B F	Wellsburg	Jefferson Medical College, 1881.
Holt, M S	Weston	Jefferson Medical College 1877.
Hale, C F	Coal Valley,	College Phys. and Surg., New York, 1867.
Hereford, J W	Mercer's Bottom,	Medical College of Ohio, 1857.
Hayworth, S M	Ravenswood,	Starling Medical College, 1858.
Henry, C O	Newburg,	College Phys. and Surg., Baltimore, 1882.
Hollingsworth, C M	Edray,	University of Maryland, 1882.
Hall, J T	Morgantown,	College Phys. and Surg., Baltimore, 1882.
Hugart, J P	Sewell,	University of New York, 1878.
Holly, E W	Hamlin,	Kentucky School of Medicine, 1882.
Hupp, A L	Lumberport,	Bellevue Hospital Medical College, 1882.
Hedges, H S	Martinsburg,	University of Maryland, 1883.
Hunt, W	Philadelphia, Pa.,	University of Pennsylvania, 1849.
Hays, I M	Philadelphia, Pa.,	University of Pennsylvania, 1868.
Henry, R S	Charleston,,	University of Maryland, 1883.
Holstein, J W	St. Albans,	University of Maryland, 1883.
Hart, Samuel	Marietta, Ohio,	Medical College of Ohio, 1852.
Highberger, W T	Maysville,	University of Maryland, 1883.
Hart, B F	Marietta, Ohio,	Bellevue Hospital Medical College, 1864.
Hoover, C S	Brownstown,	University of Maryland, 1884.
Hart, R B	Harmar,	Medical College of Ohio, 1882.
Herman, C P	Leon,	University of Louisville, 1878.
Hinerman, M S	Clarksburg,	College of Phys. and Surg., Baltimore, 1879
Hustead, A F	Wheeling,	Jefferson Medical College, 1885.
Hall, E T W	Buckannon,	University of Maryland, 1885.
Hutchins, W S	Ohio County,	Western Reserve University, Ohio, 1886.
Hendricks, N M	Morgan County,	University of Maryland, 1885.
Hardy, M V	Lower Salem,	Columbus Medical College, Ohio, 1880.

Digitized by Google

Haworth, C E.....Ravenswood,.....Starling Medical College, 1885.
Hakins, S M.....Burton,.....College of Phys. and Surg., Baltimore, 1886.
Halsy, B B.....Parkersburg,.....University of Maryland, 1885.
Hannah, P D.....Peck's Run,.....College of Phys. and Surg., Baltimore, 1886.
Hartinger, D S.....Middleport, Ohio,.....Medical College of Ohio, 1877.
Hallanon, S.....Barboursville,.....Cincinnati College of Med. and Surg., 1882.
Hensley, J L.....New Haven,.....Eclectic Med. Inst., Cincinnati, 1867.
Hysell, J H.....Pomeroy, Ohio,.....University of Buffalo, N. Y., 1861.
Hood, Thos M.....Arnettsville,.....Jefferson Medical College, 1880.
Howell, F.....Clarksburg,.....Long Island College Hospital, 1879.
Hamilton, J M.....Parkersburg,.....Pennsylvania Medical College, 1851.
Hill, W E.....Sardis,.....University of Michigan, 1872.
Hammond, J W.....Wellsville, Ohio,.....Jefferson Medical College, 1856.
Hatfield, F P.....Leechtown,.....American Med. College, St. Louis, 1878.
Huff, J T.....Rock Cove,.....Winchester, Va., Med. College, 1857.
Hunter, J H.....Martinsburg,.....University of Maryland, 1855.
Hess, Levi.....Martinsburg,.....Cincinnati College of Med. and Surg., 1864.
Harris, J T.....Hedgesville,.....College Phys. and Surg., Baltimore, 1879.
Hanna, B G.....Hedgesville,.....University of Maryland, 1858.
Harris, C B.....Martinsburg,.....College of Phys. and Surg., Baltimore, 1880.
Hollis, W B.....Unger's Store,.....Winchester, Va., Med. College, 1858.
Hedges, G B.....Martinsburg,.....University of Pennsylvania, 1877.
Hinkel, S.....Martinsburg,.....University of Pennsylvania, 1876.
Harter, S A.....Knottsville,.....Eclectic Med. Inst., Cincinnati, 1864.
Harter, J W.....Knottsville,.....Eclectic Med. Inst, Cincinnati, 1867.
Hall, R W.....Moundsville,.....University of Maryland, 1874.
Harvey, G B.....Philippi,.....University of Maryland, 1877.
Hall, J W. C.....Keyser,.....Bellevue Hospital Medical College, 1869.
Hoffman, C S.....Keyser,.....Jefferson Medical College, 1867.
Hodgson, H W.....Frankfort,.....Washington University, Baltimore, 1871.
Hall, C L.....Howard's Lick,.....Washington University, Baltimore, 1876.
Hopkins, J J.....Upper Tract,.....University of New York, 1874.
Hoy, W S.....Pt. Pleasant,.....Jefferson Medical College, 1879.
Hoyt, B B.....Ravenswood,.....Starling Medical College, 1855.
Harrison, B E.....Cottageville,.....Starling Medical College, 1878.
Hanson, J F.....Gallipolis, Ohio,.....Medical College of Ohio, 1880.
Howell, D A.....Gallipolis, Ohio,.....Cleveland Medical College, 1869.
Hall, R G.....Spencer,.....Louisville Medical College, 1879.
Hanison, J P.....Coalburg,.....Eclectic Medical Inst., Cincinnati, 1858.
Haskins, H S.....Charleston,.....University of Michigan, 1872.
Hamilton, M F.....Mannington,.....American Medical, St. Louis, 1883.
Hinckle, T Y.....Unger's Store.....Baltimore Medical College, 1884.
Hogsett, J W.....Lewisburg.....Indiana Medical College, 1875.
Hopkins, C.....Madison.....University of Maryland, 1887.
Husler, J T.....Flooding Springs.....College of Phys. & Surg., Baltimore. 1886.
Heinline, J A.....Bridgeport.....Jefferson Medical College, 1886.
Hatfield, G W.....Mt. Morris.....Western Pa. Medical College, 1887.
Hildreth, E A.....Wheeling.....Jefferson Medical College, 1886.
Hansford, J H.....Crown Hill.....University of Louisville, 1888.
Hazlett, R W.....Wheeling.....Jefferson Medical College, 1851.
Hartman. S P.....Burnt House.....Baltimore University School of Med., 1888
Hoge, R H.....Parkersburg.....Washington University, Baltimore, 1888.
Haught, F T.....Grafton.....College Phys. and Surg., Baltimore. 1888.
Hartigan, J W.....Morgantown.....Bellevue Hospt. and Med. College, 1887.
Hughes, J C.....Frenchville.....College Phys. and Surg., Baltimore, 1888.
Hume, J P.....Hinton.....College Phys and Surg., Baltimore, 1887.
Hunter, F A.....Summers co.....College Phys. and Surg., Baltimore, 1886.
Hogg, R C G.....Sewell Depot.....Bellevue Hospt. Medicine College, 1888.
Hoptanstall, J F.....Gallipolis, O.....Medical College of Ohio, 1886.
Harrison, J C.....National City.....Bennett Electric Medical College, 1888.
Holt, M S.....Weston.....Jefferson Medical Colle, 1877.
Irons, B F.....Pickaway.....Miami Medical College, 1871.

Digitized by Google

Irons, J C	Huttonsville	Hospital Medical College of Ky., 1881.
Irwin, J B	Washington, Pa	Kentucky School of Medicine, 1884.
Jobes, N D	West Liberty	Eclectic Medical College, Ohio, 1888.
Jesson, S L	Wheeling	Medical College of Ohio, 1868.
Johnson, J	Volcano	University of Maryland, 1842.
Johnston, J P	Independence	Jefferson Medical College, 1879.
Johnson, C F	Pruntytown	University Maryland, 1879.
Johnson, J C	Franklin	Washington University, Baltimore, 1873.
Johnson, J P	Franklin	Jefferson Medical College, 1856.
John, Frank	Morgantown	Eclectic Medical Institute, Cin., 1882.
Johnson, N	Paint Creek	Medical College of Virginia, 1861.
Johnson. James	Gallipolis, O	Starling Medical College, 1857.
Johnson, J P	Fairview	Medical College of Ohio, 1882.
Jaeger, W R	Peryville	University of Maryland, 1883.
Jones, R E	Potomac	Western Reserve University, 1884.
Jones, H B	Canberry	Woman's Medical College, Baltimore, 1884.
Johnston, J W	Petersburg	College of Phys. and Surg., Balt., 1885.
Jamesson, H C	Piedmont	University of Maryland, 1885.
Jones, H B	Hinton	Medical Dept. Vand. Univ. of Tenn., 1880.
Jackson, J A	Monroe Draft	University of Louisville, 1887.
Jamisson, C W	Pt. Pleasant	University of Wooster, Ohio, 1874.
Johnston, W A	Pambury, W. Va.,	College Phys. and Surg., Baltimore, 1881.
Kelly, S H	West Liberty	Jefferson Medical College, 1857.
Kock, Hugo	Parkersburg	University of Griefswald, 1865.
Kelly, J H	Parkersburg	Bellevue Hospt. Medical College, 1875.
Kendall, J E	Parkersburg	Cleveland Medical College, 1861.
Kunst, A H	Weston	Starling Medical College, 1868.
Kurz, C E	Bellaire	University of Pennsylvania, 1869.
Kennedy, Thos	Grafton	College of Medicine and Surg., Ph il., 1848.
Koblier, B F	Highview	College of Med. and Surg., Maryland, 1880.
Keer, J P	Wardnesville	Washington University, Baltimore, 1871.
Kelley, C W	Morgantown	University of New York, 1882.
Knight, A L	West Columbia	Western Reserve Medical College, 1850.
Kidd, W W	Ripley	College Phys. and Surg., Baltimore, 1878.
Keller, Leslie	Gallipolis, O	Medical College of Ohio, 1883.
Kirk, E E	Charleston	Eclectic Medical Institute, Cin., 1868.
Kincade, J R	Frankfort	Medical College of Virginia, 1878.
Knoff, G W	Alvon	College of Phys. and Surg., Balt., 1880.
Kinney, T H	Winfield	Medical College of Virginia, 1857.
Kemp, H M	Bloomington, Md	University of Maryland, 1871.
Keever, L F	Belleville	St. Louis College of Phys. & Surg., 1883.
Keene, W W	Philadelphia, Pa	Jefferson Medical College, 1862,
Kirk, Patrick	Stone Cliff	Medical College of Ohio, 1881.
Keever, A S T	Belleville	St. Louis College Phys. and Surg., 1883.
Keever, W S	Belleville	Medical College of Ohio, 1884.
Kidd, J W	Pecks Run	College Phys. and Surg., Baltimore, 1884.
Koss, A K	State	College Phys. and Surg., Baltimore, 1885.
Koonce, H	Halltown	
Kerr, J L	Upland	Louisville Medical College, 1886.
Kile, D W	Upper Tract	Louisville Medical College, 1887.
Kirk, J B	Bramwell	Col of Physicians and Surgeons, Balt, 1887.
Knatts, J D	Dunkards, Pa	University of Pennsylvania, 1880.
Kall, J B	Anderson, Pa	Jefferson Medical College, 1886.
Kipps, D N S	Wardensville	Col Physicians and Surgeons, Balt, 1888.
Lawson, A F	Hacker's Creek	Col Physician's and Surgeons, Balt., 1876.
Loloerz J R	Cairo	Louisville Medical College, 1880.
Lonchery, D C	Cherry Camp	University of Maryland, 1880.
Lewis, J S	Weston	Col of Physicians and Surgeons, Balt, 1879.
Late, Wm. M	Bridgeport	University of Pennsylvania, 1855.
Larew, J A	Academy	Col Physicians and Surgeons, Balt., 1876.
Ligon, John	Clover Lick	University of Virginia, 1858.
Lemaster, A J	Bedington	University of Maryland, 1879.

Digitized by Google

Liffitt, W F	Charlestown	Jefferson Medical College, 1853.
Lazzell, J M	Fairmont	Jefferson Medical College, 1856.
Lanham, S F	Newbery	Col of Physicians and Surgeons, Balt, 1880.
Love, J H	Grafton	University of Maryland, 1878.
Logie, James	Kearneysville	Pennsylvania Medical College, 1847.
Lounsberry, George	Coalburg	Homœpathy Medical College, N Y., 1878.
Lewis, C I	Coal Valley	Jefferson Medical College, 1858.
Laird, J M	Coal Valley	University of the city of N Y., 1877.
Lake, R P	Lewisburg	University of Maryland, 1849.
Levick, J J	Philadelphia, Pa	University of Pennsylvania, 1847.
Longsteth, Morris	Philadelphia, Pa	University of Pennsylvania, 1869.
Leidy, Joseph	Philadelphia, Pa	University of Pennsylvania, 1844.
Lackey, H J	Lowell	Cumberland University Mem. Tenn., 1872.
Lawson, J C	Bridgeport	Jefferson Medical College, 1883.
Lemen, W M	Hedgeville	University of Maryland, 1855.
Love, Wm P	Pt. Pleasant	Col Physicians and Surgeons, Balt., 1884.
Liffitt, W F	Charlestown	University of Virginia, 1884.
Long, W E	Charlestown	Bellevue Hospital Medical College, 1884.
Lewis, D A	Ohio county	Starling Medical College, 1885.
LeBland, H C	Center, Monroe Co	Western Reserve University, 1885.
Lockridge J B	Edray	University of Maryland, 1885.
Lemley, A J	Burton	Col Physicians and Surgeons, Balt., 1885.
Lucas, C C	Duffield's Depot	University of Maryland, 1886.
Legge, J H	Aurora	Jefferson Medical College, 1858.
Latham, A P	Hinton	Med. Department Vand. Univ. Tenn. 1880.
Longh, Martha E	Eno	University of Michigan, 1886.
Louderback, W H	Huntington	Louisville Medical College, 1888.
Love, L L	Teays	Missouri Medcal College, St. Louis, 1888.
Myers, E C	Wheeling	University of Maryland, 1879.
McCoy, J W	Wheeling	Medical College of Ohio, 1874.
McCracken, J C	Cameron	Long Island College Hospital, 1880
Morris, J W	Wheeling,	Pulte (Homœ) Medical College, 1876.
McCullough, J C	Woodland	Medical College of Ohio, 1881.
Miller, J M	Murphystown	Cincinnati Col of Medicine and Surg 1870.
McKeehan, B F	Clarksburg	Washington University, Baltimore, 1849.
Morgan, D P	Clarksburg	Jefferson Medical College, 1876.
Musser, P C	Jane Lew	Eclectic Medical College, Penn., 1858.
Morris, F K	Mt. Morris, Pa	Jefferson Medical College, 1876.
MacKenzie, N K	Wellsville, O	Medical Col ege of Ohio, 1844.
Moomaw, J P	Green Bank	Jefferson Medical College, 1858.
Miller, J P	Buckhannon	Medical College of Ohio, 1878.
Mix, O G	Charlestown	Columbian Medical College, 1847.
Marmion, N	Harpers Ferry	University of Pennsylvania, 1825.
Mason. G F	Charlestown	Jefferson Medical College, 1841.
Morgan, Morgan	Berkley Springs	Bellevue Hospital Medical College, 1879.
Mitchell, C L	Hedgesville	University of Maryland, 1875.
Myers, W N	Martinsburg	University of Pennsylvania, 1870.
Manning, W P	Shepherdstown	University of Maryland, 1869.
Marshall, R M	Shepherdsstown	University of Maryland, 1866.
Martin, W S	Kingwood	Starling Medical College, 1872.
Mackley, H N	Morgantown	Bellevue Hospital Medical College, 1880.
Morgan, W A	Manningtown	Eclectic Med Institute, Cincinnati, 1872.
Merrill, J M	Rivesville	Col. Physicians Surg., Ind., 1879.
Mooman, Fred	Franklin	University city of N Y , 1881.
Miller, J M	Smith's Gap	Col. Physicians and Surgeons, Balt., 1870.
Meeks, J R	Hartford City	Starling Medical College, 1860.
Middleton, J L	Winfield	Medical College of Ohio, 1864.
Mills, W W	Gallipolis, O	Starling Medical College, 1854.
Mather, V W	Huntington	(Homœ.) Medical College, of Mo., 1872.
Moss, V R	Barboursville	Medical College of Virginia, 1865.
Morris, C H	Milton	Louisville Medical College, 1878.
Mayer, D	Charleston	Eclectic Med Institute, Cincinnati, 1859.

Digitized by Google

Mayo, M L.....St. Albans.....Hampden Siding Med Col Virginia, 1866.
Malcolm. M M.....Fayette C H.....Kentucky School of Medicine, 1876.
Martin, A S.....Gap Mills.....Jefferson Medical College, 1850.
Macom, J C.....Gap Mills.....Rushville Medical College, 1850.
Miller, B C.....Westernport, Md.....Rushville Medical College, 1868.
Miller, J B.....Piedmont.....University of Maryland, 1882.
Miller, W F.....Worthington.....Jefferson Medical College, 1874.
Myers, J D.....Caperton.....University of Virginia, 1866.
Mears, J E.....Philadelphia, Pa.....Jefferson Medical College, 1865.
Morgan, W W.....Wheeling.....Col Physicians and Surgeons, Balt., 1883.
Muhleman, C L.....Parkersburg.....Cleveland (Homœ.) Hospital College, 1882.
Moore, R H.....Duffields Depot.....Col Physicians and Surgeons, Balt., 1883.
Moxley, N R, Jr.....Stone Cliff.....Miami Medical College, 1883.
Monroe, G J.....Louisville, Ky.....Bellevue Hospital Medical College, 1869.
Michael, J F.....Tunnelton.....Col. Physicians and Surgeons, Balt., 1885.
Maupin, D G.....Crown City, O.....McDowell College, St. Louis, 1857.
Marks, A D.....Rowlsburg.....Col. Physician and Surg., 1885.
Martin, F P.....Matamoras, Ohio.....Col. Physicians and Surg., Ohio, 1869.
Musgrave, J E.....Pt, Pleasant.....Starling Medical College, 1886.
Milliken, T N.....Spraggs.....Jefferson Medical College, 1858.
Morris, Spencer.....Pentress, Pa.....University of Penn., 1871.
Machin, R D.....West Grafton.....Ohio Med College, 1887.
Mercer, A B.....New Cumberland.....University of Michigan, 1884.
Mitchell, H R.....Glade Farms.....Detroit Med College, 1871.
Morrison, G P.....Martinsburg.....University city of N Y., 1881.
Monroe, J A.....West Alexandrie, Pa.Eclectic Med Col., Cincinnati, 1882.
Merchant, W T.....Charleston.....Medical Department Haward Univ., 1888
Morison, B D.....Wheeling.....Hahnem Med Col., Pa., 1888.
Mills, O S.....Shrewsbury.....Medical Col of Ohio, 1888.
McDonald, Sam'l.....Romine's Mills.....Penn. Medical Col., 1854.
McConnel, S M.....Wellsville, O.....University city of N Y., 1879.
McKerihan, I B.....Moundsville.....Medical Col of Ohio, 1877.
McCullough, A N F.....Wheeling.....Jefferson Med College, 1887.
McSherry, J W.....Martinsburg.....University of Maryland, 1855.
McLane, C H.....Morgantown.....Starling Med College, 1866.
McLane, J A.....Morgantown.....Philadelphia Col of Med and Surg., 1847.
McLane, W L.....Morgantown.....Col of Physicians and Surgeons, Balt., 1878
McGraw, J F.....Grafton.....Col of Physicians and Surgeons, Balt., 1879.
McConihay, J M.....Leon.....Kentucky School of Medicine, 1876.
McGuire, J W.....Ripley.....Bellevue Hospt. Med Col., 1878.
McDonald, G.....Union.....Jefferson Med Col., 1850.
McNutt, J P.....Red Sulphur.....Med Col of Virginia, 1869.
McChesney, R.....Lewisburg.....University of Penn., 1857.
McClaughtery, D W.....Princton.....Med Col of Ohio, 1870.
McCan, P.....Newton.....Starling Med Col., 1855.
McPherson, J H.....Lewisburg.....Jefferson Med Col., 1855.
McGinnis, A B.....Guyandotte.....Med Col of Ohio, 1854.
McCollum, W H.....Limestone.....Starling Med Col., 1878.
McGuffin, R M J.....Sewell Station.....University of Penn., 1872.
McClure, J.....Marietta, O.....Starling Med Col., 1864.
McGumphy, W G.....Wheeling.....Starling Med Col., 1882.
McMaster, R O.....Wheeling, ...Starling Medical College, Ohio, 1875.
McKrin, F E.....Marietta, Ohio,.....Medical College of Ohio, 1884.
McKinly, C G.....Indian Camp,.....Eclectic Medical Institute, 1884.
McNeer, H V.....Union,.....Bellevue Hospital Medical College, 1886.
McClintic, F M.....Edray,.....Medical College of Virginia, 1887.
McDonald, I W.....New Cumberland,.....Cleveland Medical College, 1882.
McQuain, J E.....Glenville,.....Louisville Medical College, 1888.
McCauley, W H.....Braxton C H,.....College of Phys. and Surg , Baltimore, 1888
Nelson, M P.....Middleway, ...University of Pennsylvania, 1822.
Nixon, J L.....Flemington, ...Western Reserve University, 1878.
Neill, W.....Charlestown,.....Bellevue Hospital Medical College, 1881.

Digitized by Google

Neale, W P.....Pt. Pleasant,.....University of Pennsylvania, 1872.
Nye, G L.....Hurricane Bridge .....Medical College of Virginia, 1869.
Newton, W S.....Gallipolis, Ohio,.....Medical College of Ohio, 1845.
Needham, W C H.....Gallipolis Ohio,.....Jefferson Medical College, 1868.
Newlan, W P .....Sutton,.....University of Louisville, 1871.
Neadrow, J S.....Maysville,.....Western Reserve Union, 1882.
Nicholson, J T.....Rock Lick,.....Starling Medical College, 1882.
Noel, E E.....Green Sulphur Sp'gs,College Phys. and Surg., Baltimore, 1884.
Nash, C P.....Buffalo,.....College Phys. and Surg., Baltimore, 1884.
Niles, L E .....Wheeling,.....Dartmouth Medical College, 1883.
Neill, A O .....Wirt County,..... .... University of Michigan, 1864.
Osburn, A .....Rippon,.....University of Maryland, 1848.
Osburn, H.....Rippon,.....University of Maryland, 1877.
Ogden, P B.....Fairmont,.....Jefferson Medical College, 1867.
Offutt, J J F.....Capon Bridge,.....Winchester Virginia Medical College, 1857.
O'Neill, W J..... .....Winfield,.....Kentucky School of Medicine, 1876.
Overton, W M.....Raleigh C H,.....Jefferson Medical College, 1851.
Ogden, C B.....East Liverpool, O.,...Medical College of Ohio, 1878.
Oxley, S W.....Hamlin, ...University of Maryland, 1882.
Ogden, W C.....Fairmount,.....Bellevue Hospital Medical College, 1878.
Offutt, J S..... .....Capon Bridge,.....Univ. of Maryland, 1887.
Pipes, J H.....Wheeling,.....Bellevue Hospital Medical College, 1883.
Prickett, S H.....Mineral Mills,..... Miami Medical College, 1874.
Prickett, I T.....Tyner, ...Miami Medical College, 1876.
Phister, M H.....Parkersburg,.....Pulti (Homeopathic) Medical College, 1874.
Parke, B R.....Hellsville, Pa.,.....Jefferson Medical College, 1870.
Price, T H.....Morgantown,.....Jefferson Medical College, 1876.
Priest, F M.....Mt. Freedom,.....Medical College of Virginia, 1868.
Pendleton, E B.....Berkeley Springs,.....University of Maryland, 1841.
Pharr, D C.....Gap. Mills,.....Medical College of Virginia, 1879.
Patrick, A S.....Lewisburg,.....Medical College of Ohio, 1853.
Peck, S P.....Hinton,.....College Phys. and Surg., Baltimore, 1877.
Price, H D.....Lockhart's Run,.....Miami Medical College, 1882.
Purviance, J F.....Holliday's Cove,.....Philadelphia Medical College, 1865.
Price, B F.....Hartford City,.....Cincinnati College Med. and Surg., 1869.
Probst, C O.....West Columbia,.....Miami Medical College, 1882.
Philson, J R.....Racine, Ohio,..... .....Starling Medical College, 1876.
Palmer, L W.....Brownstown,.....Academy of Medicine, Louisville, 1877.
Perry, E W.....Halltown,.. ....College Phys. and Surg., Baltimore, 1882.
Pratt, C E.....Charlestown,.....University of Virginia, 1874.
Pepper, W.....Philadelphia, Pa.,....University of Pennsylvania, 1864.
Packard, J H.....Philadelphia, Pa.,....University of Pennsylvania, 1853.
Powell, M T.....Webster,.....College Phys. and Surg., Baltimore, 1883.
Parsons, E F.....Piedmont,.....Medical College of Virginia, 1865.
Prichard, S J.....Huntington,.....Medical College of Ohio, 1883.
Patten, S B.....Letart Falls, Ohio,.....Columbus Medical College, 1878.
Priest, S C.....Newark, Ohio,.....Cincinnati College Med. and Surg., 1877.
Proudfoot, M H.....Rowlesburg,.....Starling Medical College, 1884.
Pfast, J M.....Jackson C. H.,.....College Phys. and Surg., Baltimore, 1885.
Palmer, J B.....Kanawha C. H.,.....Kentucky School of Medicine, 1879.
Pifer, J L.....Upshur County,.....Ohio Medical College, 1883.
Pinnell, G W.....Bull Creek,.....Cleveland Medical College, 1872.
Pepper, R H.....Huntington,.....Cleveland (Homeopathic) Med. Col., 1885.
Preas, J H.....Whitesburg, Tenn.....Jefferson Medical College, 1886.
Pickering, W D.....Lone Cedar.....College Phys. and Surg., Baltimore, 1887.
Posten, S I..... .....Independance .....College Phys. and Surg., 1883.
Pipes, J R.....Wheeling .....Western Reserve University, 1883.
Pearce, E., jr.....Steubenville, O.....Louisville Medical College, 1885.
Porter, A L.....Thomas .....University of Maryland, 1883.
Quesberry, V.....Hinton .....Jefferson Medical College, 1854.
Quesberry, G D.....Hinton.....College Phys. and Surg., Baltimore, 1887.
Reed, J B..... .....Wheeling.....Charity Hospital Med. Col., Ohio, 1882.

Digitized by Google

Rogers, D R.....New Martinsville .....Jefferson Medical College, 1880.
Roach, J R.....Weston .....Winchester (Virginia) Med. Col., 1857.
Rhees, M J.....Wheeling .....Jefferson Medical College, 1846.
Rexroad, A J.....Smithville.. .....Starling Medical College, 1877.
Ramsey, J W.....Clarksburg..... ..... Jefferson Medical College, 1853.
Reeves, J E.....Wheeling..... . University of Pennsylvania, 1860.
Russell, W P.....Raven Rock..... Cincinnati Col. of Med. and Surg., 1879.
Reger, R A.....Buckhannon .....Jefferson Medical College, 1880.
Rusmisel, S C.....Burnersville..... .....Medical College of Ohio, 1876.
Ranson, B B..... Harpers Ferry .....University of Maryland, 1869.
Ross, D R..... North Mountain.....Starling Medical College, 1869.
Reynolds, John.....Sheperdstown.....University of Maryland, 1840.
Reger, A G.....Fairmont .....Jefferson Medical College, 1877.
Rohrbaugh, J B..... .....Grafton.....Louisville Medical College, 1875.
Rader, W H.....Piedmont.....University of Virginia, 1871.
Richardson, C T..... Charlestown ....Medical College of Virginia, 1868.
Reynolds, A S.....Shepherdstown.....Univers'ty of Maryland, 1880.
Richards, C W.....Edray.....Jefferson Medical College, 1878.
Roger, D.....Buffalo .....Miami Medical College, 1875.
Rathburn, J C.....Gallipolis .....Starling Medical College, 1852.
Rehm, S.....Pomeroy, Ohio.....College, Germany, 1840.
Reid, C K..... . .Middleport, O.....Jefferson Madical College, 1853.
Rayman, E F..... Frankfort.....Berkshire Med. Col., Massachusetts, 1859.
Roush, L F..... .....New Haven.....Miami Med. Col., 1868.
Ryan, P M..... .....Elm Grove.....University of Louisiana, 1851.
Ross, M L.....Lundville .....Eclectic Med. Institute, 1872.
Ross, Hugh.....Minersville.....Trinity Col., Canada, 1892.
Pohe, G H.....Baltimore, Md.....University of Maryland, 1873.
Robinson, A V.....Peabody .....Bellevue Hospt. Med. Col , 1881.
Ravenscroft, W H.....Parkersburg.....Jefferson Med. Col., 1857.
Reed, G W..... .....Marietta, O.....Miami Med Col., 1878.
Rupert, L.....Big Clear Creek.....University of Louisville, 1883.
Rohrbaugh, C C.....Tabbotts.....Col. Phys. and Surg., Baltimore, 1884.
Roderick, S S.....Philippi.....Col. Phys. and Surg., Baltimore, 1884.
Rowan, P J..... .....Grafton .....Col. Phys. and Surg., Baltimore, 1885.
Reed, R I..... .....Wheeling .....Bellevue Hospt. Med. Col., 1884.
Rexroad C W.....Sinets Mill..... Starling Med Col., 1886.
Robins, J E.....Stone Cliff.....Jefferson Med. Col., Phil., 1883.
Rice, C H.....Randolph co.....University of Maryland, 1886.
Rupert, L B.....Fayette co.....Louisville Medical Col., 1886.
Richter, O F.....Sweet Springs.....Virginia Medical Col., 1884.
Ramsey, R Y.....Huntington.....University of New York, 1871.
Reece, W S.....Pomona .....Louisville Med. Col., 1886.
Riley, C T.....New Matamorras.....Pulti (Homeo.) Med. 1881.
Reamer, H C..... .....Davis..... .....University of Maryland, 1885.
Row, W D.....Huntington..... .....Col. Phys. and Surg., Baltimore, 1888.
Ray. C A.....Coal Valley.....Col. Phys. and Surg., 1887.
Roberts, H I.....Wheeling .....Washington University, Baltimore, 1888.
Rose, Eli.....Burton .....Col. Phys. and Surg., Baltimore, 1888.
Stifel, A F.....Wheeling.....University of Lutzig, Germany, 1879.
Silvey, J H.....Wheeling.....Bellevue Hospt. Med. Col., 1878.
Sook, Mary P.....Wheeling.....Cleveland (Homeo.) Med. Col., 1880.
Sharp, W H..... .....Volcano ....University of Pennsylvania, 1865.
Scott, Isaac..... .....Parkersburg.....Jefferson Med. Col., 1847.
Scott, Charles..... .....Parkersburg.....Jefferson Medical Col., 1881.
Storer, J H.....Triadelphia,..... Jefferson Medical College, 1854.
Sayler, A.....New Palestine, Ohio,Eclectic Medical Institute, 1881.
Stalnaker, A G..... Buckhannon,.....Eclectic Medical College, New York, 1876.
Simpson, G B .....Weston, ...Jefferson Medical College, 1871.
Stathers, W E.....Middlebourn, ...College Phys. and Surg , Baltimore, 1881.
Shriver, Collie.....Bethany, ...Jefferson Medical College, 1875.
Steere, D Q..... .....Bellaire, ...Medical College of Ohio, 1875.

Digitized by Google

Smith, C W .....Weston, ...Jefferson Medical College, 1878.
Sloan, E.....Williamstown,.....Eclectic Medical Inst., Cincinnati, 1878.
Sigler, G P.....Pennsboro, ...University of Maryland, 1877.
Spencer, J R .....Wadesville, ...Eclectic Medical Inst., Cincinnati, 1881.
Stidger, S B .....Moundsville,..... .....Jefferson Medical College, 1882.
Shriver, J M.....Jollytown, Pa., ...Jefferson Medical College, 1881.
Steetor, W W.....Wheeling,.....National Medical College, D. C., 1871.
Smith, I C.....Peel Tree,.....Kentucky School of Medicine, 1876.
Snodgrass, J B.....Martinsburg,.....Jefferson Medical College, 1870.
Starry, J D.....Charlestown,.....Jefferson Medical College, 1847.
Sencindiver, L M.....Darksville,.....Jefferson Medical College, 1858.
Scott, S M.....Cranberry,.....University of Maryland, 1871.
Smith, J B.....Farmington,.....College Phys. and Surg., Keokuk, 1877.
Satterfield, C E.....Mannington,.....College Phys. and Surg., Baltimore, 1878.
Stirling, A W.....Palatine, ...Jefferson Medical College, 1871.
Shury, W A.....Piedmont,.....University of Virginia, 1878.
Summerville, R H.....Moorfield, ...University of Maryland, 1882.
Stuart, T F.....Leon, ...College Phys. and Surg., Baltimore, —.
Shields, Wm.....Sink's Grove, ...College Phys. and Surg., Baltimore, 1877.
Spicer, J B.....Alderson,.....Medical College of Virginia, 1866.
Sanns, J.....Gallipolis, Ohio,.....University of Pennsylvania, 1880,
Sanns, H V.....Millers, Ohio,.....Medical College, of Ohio, 1880.
Stone, J S .....Racine, Ohio, ...Medical College of Ohio, 1870.
Summers, A E.....Charleston, ...University of Louisville, 1848.
Sale, J C.....Paint Creek,.....Washington University, Baltimore, 1870.
Shumate, G A. .....Concord Church,.....Medical College of Virginia, 1875.
Stierin, H.....Mason City,.....University of Munich, Germany, 1854.
Sutherland. W B.....St. Albans,.....Transylvania University, Kentucky, 1843.
Smith, G.....Frankfort, ...University of Pennsylvania, 1844.
Shane, G A.....Steubenville, Ohio,...Bellevue Hospital Medical College, —.
Streator, A C.....Worthington,.....Cleveland Medica College, 1882.
Schoffer, J P.....Parkersburg,..... ..Louisville Medical College, 1882.
Sawyer, Sarah H.....Pt. Pleasant,.....Starling Medical College, 1880.
Sawyer, E O .....Pt. Pleasant,.....Starling Medical College, 1880.
Spangler, C W.....Peeterstown,.....College Phys. and Surg., Baltimore, 1883.
Scratchley, F A..... .....White Sulphur,.....University of New York, 1881.
Smith, J E.....Wheeling, ...Georgetown Medical College, 1868.
Stump, L J..... .....Stumptown,.....Medical College of Virginia, 1883.
Snyder, W F.....Charleston,.....Jefferson Medical College, 1884.
Swallow, H H.....Clifton, ...Starling Medical College, 1884.
Sherman, W C.....Belpre, Ohio,.....Miami Medical College, 1885.
Sites, J M.....Upper Tract,.....University Medical College,New York,1885.
Slocum, S M.....Wheeling,.....University, City of New York, 1879.
Sammons, J L.....Calls,.....Starling Medical College, 1885.
Staton, W A..... .....Peytona,.....Kentucky School of Medicine, 1885.
Stone, S A.....Parkersburg,.....College Phys. and Surg., 1886.
Smith, L B.....Crown City,.....Western Reserve University, 1886.
Swimley, G W.....Bunker Hill,.....Ohio Medical College, 1876.
Sanders, W B .....Wellsburg, ...Cleve'and (Homeopathic) College, 1886.
Shuttleworth, W B.....Clarksburg, ...Jefferson Medical College, 1887.
States, D 1.....Matamoras, ...Pult. (Homeopathic) College, 1884.
Sanford, W A.....Grafton,.....Albany Medical College, 1861.
Stellings, B W.....Land Hill,.....Cleveland (Homeopathic) Hosp. Col., 1883.
Smith, W A..... .....Ripley,.....Medical College of Ohio, 1888.
Swann, P H.....Barboursville,.....University of Louisville, 1888.
Stump, J L.....Copenhavers,.....Virginia Medical College, 1888.
Stovall, I F..... .....Raleigh C H.....Louisville Medical College, 1885.
Shife, M B.....Westernport..... .....University of Maryland, 1885.
Smith, H M.....Eureka, O..... .....University of Louisville, 1888.
Sherrill, L V.....Raliegh C H.....University of Louisville, 1888.
Smith, B M.....Davis..... .....University of Maryland, 1888.
Schall, H M.....Whelling..... .....Jefferson Medical College, 1887,

Digitized by Google

Slaymaker, E W.....Berkely Springs.....University of Maryland, 1887.
Thompson, W H.....Berkeley Springs.....Cleveland (Homœ) Medical College, 1880.
Teagarden, W D.....Dallas.....Cleveland Medical College, 1880.
Thomas, E C.....Moundsville.....Medical College of Ohio, 1860.
Talbott, W E.....Rock Cave.....Col Physicians and Surgeons, Balt., 1880.
Turner, C B.....Charlestown.....University of Louisville, 1881
Thompson, W J.....Berkely Springs.....Wichester, Va Medical College, 1859.
Thomas, W U.....Basnettsville.....University of Maryland, 1875.
Thayer, A H.....Grafton.....University of Maryland, 1876.
Trippett, R B L.....Kingwood.....Louisville Medical College, 1872.
Tanner, J.....Shepherdstown.....University of New York, 1845.
Thomas, D A.....Red House.....Hospital Medical College, Ky., 1880.
Thompson, S B.....Winfield.....Winchester, Va Medical College, 1866.
Thompson, J N.....Milton.....Kentucky Hospital Medical College, 1880.
Taylor, A C.....Hamlin.....Louisville Medical College, 1879.
Thomas, F S.....Malden.....University of Maryland, 1878.
Tobey, N D.....Clifton.....University of Maryland, 1863.
Tyrer, W A.....Hawks Nest.....University of Virginia, 1867.
Taylor, K.....Slones X Roads.....Washington University, Balt., 1870.
Thompkins, W W.....Charleston.....Col Physicians and Surgeons, N Y., 1882.
Tearney, J F.....Harpers Ferry.....University of Maryland, 1879.
Twiggs, W F.....Keyser.....University of Pennsylvania, 1883.
Talbot, L N.....Philippi.....University of Pennsylvania, 1883.
Tyson, J.....Philadelphia, Pa.....University of Pennsylvania, 1863.
Taylor, R B.....Philadelphia, Pa.....University of Pennsylvania, 1849.
Taylor, D H.....Summerfield, O.....Miami Medical College, 1878.
Taylor, J R.....Archer's Fork, O.....Col Physicians and Surgeons, Balt., 1881.
Tice, F C.....Wellsburg.....Jefferson Medical College, 1879.
Thomas, A L.....Crown City, O.....University of Nashville, 1883.
Telton, C L.....Monongalia.....Western Reserve University, 1886.
Thomas, P S.....Charleston.....Louisville Medical College, 1888.
Townsend, W G.....Academy.....University of Maryland, 1888.
Taylor, J D.....Ridgeville.....Rushville Medical College, Ill., 1888.
Taylor, G F.....Hedgesville.....Col Physicians and Surgeons, Balt., 1878.
Ulrich, C F.....Wheeling.....University of Louisville, 1870.
VanKirk, W F.....Grafton.....Jefferson Medical College, 1868.
Vinson, B C.....Milton.....Medical College Virginia, 1867.
Vasbury, A J.....Fayette C H.....Col Physicians and Surgeons, Balt., 1881.
Vogal, G B.....Peterstown.....Col Physicians and Surgeons, Balt., 1883.
Vandeer, G W.....Peabody.....Ohio Medical College, 1886.
Veber de Witt, J.....Wolf Creek.....University of Maryland, 1886.
Vermillion, J C.....Foss.....Col Physicians and Surgeons, 1883.
Wilson, L D.....Wheeling.....University Pennsylvania, 1870.
Watson, J B.....St. Marys.....Col Physicians and Surgeons, Balt., 1870.
Warder, J I.....Weston.....University of Maryland, 1879.
West, W L.....New Matamoras, O.....Jefferson Medical College, 1875.
Werick, T H.....Wellsburg.....University of Michigan, 1873.
Wells, Thomas M.....Hannibal, O.....(Hahnem) Medical College, 1875.
Walter, Z D.....Marietta, O.....(Hahnem) Medical College, 1866.
Wallace, M.....Mill Point.....University of New York, 1849.
Wager, L.....Charlestown.....University of New York, 1850.
Wiley, J B.....Gerardstown.....Medical College of Virginia, 1854.
Wilson, J E.....Summit Point.....Jefferson Medical College, 1857.
Williams, E C.....Martinsburg.....Jefferson Medical College, 1869.
Wilson, E K.....Moorefield.....Jefferson Medical College, 1878.
West, T H.....Keyser.....University of Pennsylvania, 1870.
Wall, T W.....Capon Bridge.....University of Pennsylvania, 1837.
Welfly, R H.....Romney.....University of Maryland, 1882.
Walls, H L.....Poca.....University of Maryland, 1881.
Waggoner, C B.....Arbuckle.....Louisville Med Col., 1875.
Williams, J P.....Peterstown.....Col. Phys. and Surg., Baltimore,
Watkins, W A.....Pomeroy, O.....Med. Col. of Ohio, 1878.

Digitized by Google

Weaver, C W.....Letart Falls, O.....Med. Col. of Ohio, 1879.
Wall, J O.....Huntington.....Med. Col. of Ohio, 1875.
Witten, R.....Blue Stone. Va.....Col. Phys. and Surg., Baltimore, 1879.
Wetzell, D E.....Huntington.....Louisville Med. Col., 1879.
Watkins, J F.....Charleston.....Jefferson Med. Col., 1858.
Watkins, T C.....Charleston.....Transylvania University of Ky., 1882.
Walker, J R.....Fayetteville.....Eclectic Med. Institute
Woods, O J.....Princeton.....Col. Phys. and Surg., Baltimore, 1881.
Williams, J P.....Peterstown.....Col. Phys. and Surg., Baltimore, 1877.
Woodville, J L.....Sweet Springs.....University of Pennsylvania, 1844.
Williams, B I.....Martins Ferry, O.....University of Pennsylvania, 1873.
Woofter, A J.....Tray.....Col. Phys. and Surg., 1882.
Wyett, J A.....New York City.....Bellevue Hospt. Med. Col., 1869.
West, T B.....Sistersville.....Cincinnati Col. Med. and Surg., 1873.
Wood, J A.....Paint Creek.....Eclectic Med. Institute, 1882.
Wysor, J C.....Coal Valley.....Col. Phys. and Surg., Baltimore, 1878.
Winternitz, I A.....Wheeling.....Miami Med. Col., 1882.
Wharton, J T.....Ceredo.....University of New York, 1860.
Wilcox, J F.....Charleston.....University of Louisville, 1883.
Walkinshaw, J B.....Wellsburg.....Western Reserve University, 1883.
Wilson, R B.....Philippi.....University of Maryland, 1884.
Wade, S S.....Morgantown.....Jefferson Med. Col., 1884.
Wamsley, J E.....Beuerly.....Jefferson Med. Col., 1884.
Warder, A S jr.....Grafton.....University of Maryland, 1885,
Wayman, J F.....Proctor.....Col. Med. and Surg., Michigan, 1883.
Wandless, H W.....Linside.....Col. Phys. and Surg., Baltimore, 1885.
Wolfe, W H.....Martinsburg.....University of Maryland, 1886.
West, J J.....Martinsburg.....University of Maryland, 1886.
Williamson, W T.....Cannelton.....University of Louisville, 1886.
Warder, A R.....Charleston,.....Western Reserve University, 1886.
Wilson, E F.....Pomeroy,.....University of Pennsylvania, 1885.
Wall. A.....Springfield,.....University of Pennsylvania, 1854.
Williams, J W.....Barboursville,.....University of Louisville, 1887.
Wilson, W C Q.....New Freeport, Pa.....Starling Medical College, 1872.
Workman, R.....Springfield,.....University of New York, 1887.
Watson, J B Jr.....St. Marys,.....College Phys. and Surg., Baltimore, 1887.
Wetzel, Lulu.....Huntington,.....Womans' Hosp. Med. Col., Illinois, 1887.
Wilson, F L A.....Princeton,.....College Phys. and Surg., Baltimore, 1887.
Woods, G B.....W. Alexandria, Pa.,..University of Wooster, 1874.
Yeater, J W.....New Dale,.....College Phys and Surg., Baltimore, 1880.
Yost, E B.....Warren,.....Starling Medical College, 1854.
Yokum, H.....Beverly,.....Jefferson Medical College, 1885
York, L H.....Fort Gay,.....Eclectic Medical Institute, 1882.
Yates, T B.....West Grafton,.....University of Maryland, 1887.
Zimmerman, A B.....Shanghai,.....Baltimore Medical College, 1884.

Digitized by Google

PRACTITIONERS OF TEN YEARS PRIOR TO 1881.

Name	*Address.*
Ashburn, A	West Union.
Amos, B J	Avon.
Adams, A D	Steer Creek,
Austin, F M	St. George.
Arbogast, J E	Mt. Freedom.
Atkinson, B H	Sutton.
Allen, E G	Gallipolis, Ohio.
Appleton, J W M	Salt Sulphur.
Adkins, M	Queen's Ridge.
Anderson, Alexander	Fairview.
Brookover, R	Uniontown.
Berkeley, C	Middlebourne.
Baker, E M	Brown's Mills.
Blair, M A	Johnstown.
Bushfield, J M	St. Marys.
Bond, E D J	Davisville.
Bartlett, M D	Mole Hill.
Bee, A J S	Harrisville.
Bland, N B	Weston.
Bartlett, T B	New Salem.
Brown, D E	Benwood.
Bond, N C D	Bensville.
Bayoloh, J	Farmington.
Bryte, M S	Princeton.
Bodgley, D C	Simpsons.
Barnes, J C	Boothsville.
Boyers, C F	Palatine.
Binns, J H	Barrascksville.
Booth, J C	Brant.
Brown, A	Webster.
Bosworth, J W	Philippi.
Benedum, C W	Addison.
Byrd, W E	Belington.
Bowen, C W	Springfield.
Boyd, H P	Piedmont.
Bryan, L B	Springfield.
Bryan, W P	Union Ridge.
Bond, W C D	Ravenswood.
Barber, S L	Cottageville.
Brown, J J	Raleigh C. H.

Digitized by Google

Baily, A G.....Spencer.
Barr, S.....Rudy.
Barnes, E W.....Walton.
Brown, J W.....Oceana.
Buckly, S L H.....Cove Gap.
Brake, N B.....Walton.
Backers, I.....Nicholas C. H.
Bowles, W H.....Milton.
Bicknell A A.....Flat Top.
Brown, E H.....Tazewell county, Va.
Bachtel, J M.....Jackson C. H.
Brown, G A.....Cross Lanes.
Brown, H.....Queen's Shoals.
Ball, J.....Madison.
Boyd, M W.....Hartford.
Brown, W A.....Dunkard, Pa.
Browning, J E.....Madison.
Bingell. C D J.....Wheeling.
Ball, J D L.....Barboursville.
Clark, W F.....Kidwell.
Cracraft, W A.....Elm Grove.
Cornell, Wm.....Long Peach.
Cather, V.....Wolf Summit.
Collins, J P.....Wirt C. H.
Cunningham, B F.....Tannersville.
Cross, R J.....Clarksburg.
Conoway, J B.....Cherry Camp.
Carder, J F.....New Salem.
Carr, J L.....Clarksburg.
Craig, J L.....Clarksburg.
Carden, A S.....Cherry Camp.
Crumine, J B.....Pennsboro.
Coplin, A.....Goose Creek.
Clark, A G.....Parkersburg.
Cramer, S E B.....White Day.
Collins, J W.....Valley Point.
Curry, W H.....Rock Cove.
Casselbury, M L.....Morgantown.
Cartar, P.....Edray.
Calvert, F M.....Blacksville.
Cromley, F A.....Gallipolis.
Conant, S.....Salt Lake Bridge.
Casto, J C.....Staat's Mills.
Cotton, J T.....Charleston.
Coaleman, S S.....Hamlin.
Cooper, F W.....Spencer.
Chisholm, S A.....Lowell.
Campbell, W.....Richlands.
Cherrington, —.....Mason City.
Cadwallender, R.....Caskins.
Crouch, R G.....St. Albans.
Clay, S G.....Lewisburg.
Casper, G W.....Boyds.
Comstock, C.....Beach Hill.
Carter, J D.....Milton.
Dew, M H.....West Milford.
Dawson, Z E.....Wilsonbury.
Devon, S.....Middlebourn.
Degarmour, W.....Uniontown.
Dew, R W.....New Salem.
Duncan, J C.....Cameron.
Davis, J R.....Moundsville.

Digitized by Google

Davis, E S.....Cameron.
Davis, P.....Shinston.
Donner, R G.....Newark.
Dent. W M.....Newburg.
Dent, M.....Newburg.
Duncan, D M.....Farmington.
Deshous, J H.....Addison.
Dunhan, J H.....Morgan Glade.
Davis, R S.....Iukerman.
Dent, G W.....Anettsville.
Dickerson, H B.....Mt. Hope.
Dunlap, J H.....Letart.
Diddle, J A.....Coalburg.
Deshous, J H.....Webster C H.
Davis, J K.....Malden.
Dunbar W S.....Clear Creek.
Drodby, C A.....Beaver Mills.
Dawson, D C.....Forks of Twelve Pole.
Dunbar, W S.....Willow Bend.
Eagan, C W.....Glenville.
Evans, J.....Jane Lew.
Elliott, F I.....Flemington.
Elliott, Felix.....Kingswood.
Eastion, F.....Calhoun.
Ellison, A M.....Braxton C H.
Edington, J C.....Arbuckle.
Elliott, N.....Gallipolis.
Estep, E.....Peytona.
Frayhorn, J F.....Kasson.
Ford, S.....Wheeling.
Fisher, W S.....Bridgeport.
Franks, G K.....Burton.
Flowers, C B.....Prospect Valley.
Ford, H F.....Benwood.
Fox, D G B.....Avon.
Fogle, J B.....Cranberry.
Fletcher, G M.....Blacksville.
Fittner, D.....Cramensville.
Farnsworth, T G.....Buckhannon.
Franz, H.....Maysville.
Fichtner, M L.....Pleasant Hill.
Fielder, F G.....Charleston.
Fielder, N F.....Charleston.
Forbes, D R.....Snow Hill.
Feazell, W.....Raleigh C H.
Fleming, E B.....Centre Pt.
Ferguson, W.....Oceana.
Garrett, C P.....Hengrove.
Garrett, J A.....Hazel.
Gregg, J.....Quiet Dell.
Glover, J R.....Auburn.
Grim, R B.....Uniontown.
Gorrell, J B.....Shirley.
Gibson, D W.....Huttonsville.
Gould, J C.....Farmington.
Gilbert, W.....Graham's Mines.
Gibson, N G.....Braxton C H.
Gilliam, E L.....Letart.
Gillespie, J C.....Winfield.
George, O.....Chapmansville.
Griffith, J W.....Barboursville.
Hardee, W H B.....Sistersville.

Digitized by Google

Haught, E P.....Silver Hill.
Hughes, M W.....Tray.
Hoskinson, G W.....Butler's Station.
Howard, W D.....St. Joseph.
Holcomb, J F.....Sistersville.
Hennig, B J.....Wheeling.
Hoey, J M.....Yeaters Mills.
Horner, W H.....Duck Creek.
Healton, W C.....Tannersville.
Hall, S W.....Jane Lew.
Hutchinson, W W.....Ireland.
Hanshaw, G R.....Ellenboro.
Harris, T M.....Harrisville.
Hartman, R L.....Independence.
Hamilton, S T.....Georgetown, Pa.
Hall, A J.....Rowlsburg.
Humphreys, J B.....Meadland.
Haymond, D S.....Leadsville.
Horner, W.....Belfont.
Hatfield, J.....Mt. Morris, Pa.
Hartley, J F.....Leervey.
Hogue, W P.....Charleston.
Hulbert, C.....Charleston.
Hereford, M R.....Hookersville.
Hensley, B M.....Walton.
Hoff, J W.....Pomeroy, Ohio.
Holland, W E.....Meadow Bluff.
Hayes, E.....Peytonia.
Harvey, J.....Raliegh, C H.
Henderson, G.....St. Albans.
Horn, W P.....Boone C H.
Hundly, G A.....Williamsburg.
Hamilton, L H.....Charleston.
Hammond, E.....Spencer.
Humphrys, S L.....Indian Creek.
Holbrook, J W.....Raliegh C H.
Hall, M S.....Harrisville.
Hunter, F A.....Summers county.
Hansford, W D.....Eglon.
Harris, M A.....Hartford City.
Hotchkiss, J E.....Balbon.
Ice, W.....Sistersville.
Ice, R E.....Brant.
Inner, S.....Overfield.
Jolliffe, H.....Pine Grove.
James, D.....Valley Mills.
Jones, W S.....Central Station.
Jones, W F.....Hebron
James, A A.....New Milton.
Jones, L H.....Central Station.
Jones, A P.....Hebron.
John, G H.....Morgantown.
Johnson, J H.....Lesage.
Jennings, J D F.....Jackson C H.
Jarrell, W J.....Raliegh C H.
Jenkins, J S.....Charleston.
Kelly, G W.....Wheeling.
Kearns, C H.....Middlebourne.
Kirker, W E.....Wellsburg.
Keever, J S.....Belleville.
Kelley, G W.....Brown's Mills.
Kemble, J C.....Evansville.

Digitized by Google

Kirk, W V.....Paw Paw.
Kuzendall, J M.....Petersburg.
Kincaid, A C.....Frankfort.
Kidd, A W.....Jackson C H.
Kerr, J B.....Upland.
Koontz, E P.....Reynolds' Store.
Keck, W T.....Myra.
Kelly, J M.....Portland, Ohio.
Layfield, W.....Camden.
Lacy, J A.....Pennsboro.
Lambey, M.....New Dale.
Lloyd, J M.....Reedsville.
Leatherman, M.....Purgettsville.
Lemmon, J A.....Greenland.
Lynch, L C.....Cutless.
Lee, R H.....St. Albans.
Lambert, W T.....Bear Branch.
Lilly, A H.....Jumping Branch.
Lallance, J.....Cottageville.
Lawson, G W.....Logan county.
Mayfield, S.....Conaway.
Marshman, F F.....Dallas.
Malloy, M R.....Middlebourne.
Mrrtin, M G.....Big Springs.
Maxwell, L B.....Hebron.
Martin, J F.....Brown's Mills.
Mason, A B.....Wadestown.
Manown, J H.....Kingwood
Mason, J J.....Buckhannon.
Mathers, J K.....Buckhannon.
Morgan, J M.....French Creek.
Miller, J M.....Rowlesburg.
Morris, M K.....Wheeling.
Mason C C.....Madison.
Miller, D D.....St. Albans.
Mairs, W.....Sissonville.
Milhe, J.....Sissonville.
Murphy, F.....St. Albans.
Mitchell, J.....Logan C. H.
Mulligan, T.....Ceredo.
Morris, N B.....Olive.
Magovern, T S.....Leon.
Moore, P D.....Frozen Camp.
Morrison, C.....Barboursville.
Martin, E H.....Toll Gate.
Marshall, J D.....Centreville.
Murray, J W.....Louisa, Ky.
Matheny, J E.....Troy.
McCoy, H.....Wheeling.
McCutcheon, G S.....Greenville.
McWhooter, J S.....Troy.
McKinnie, G W.....Ella.
McLane, P C.....New Cumberland.
McKeever, D W.....Belleville.
McGinnis, W H.....Hawerville.
McCarrell, J.....Wellsville.
McEwnen, J B.....Glenville.
McWhooter, J M.....Hacker's Creek.
McKeever, J M.....Wardensville.
McCarrell, J F.....Hamlin Station, Pa.

Digitized by Google

McMorrow, J.....Tate Creek.
McCullough, P H.....Huntington.
McJones, G.....Island Branch.
McLane, G B.....Charleston.
McClure, N.....Hamlin.
McCutcheon, R.....Winston.
McClung, W H.....Meadow Bluff.
McNutt, R B.....Princeton.
McErvin, J E.....Beaver Mills.
McClung, G A.....Mount Lookout.
McClung, W H H.....Caperton.
New, J W.....Moundsville.
Newton, G A.....Buckhannon.
Neal, H V.....Keyser.
Noel, N W.....Green Sulphur Springs.
Nye, J W.....Scott Depot.
Napier, W.....Fry.
Neplerotte, W A.....Staats' Mills.
Newborough, S W.....Ellenboro,
Ogden, W H.....Sardis.
Ogden, J A.....Hinton.
Owen, J N.....Milo.
Orndorff, P S.....Copan Springs.
Owahood, H.....West Union.
Pinell, D S.....Clarksburg.
Pinell, D S Jr.....Romine's Mills.
Prichard, W.....Pennsboro.
Parkinson, J.....Independence.
Prichard, W.....Berea.
Pullen, A.....Manington.
Parsons, E.....Meadville.
Pinell, P T.....Buckhannon.
Patternson, S P.....Huntersville.
Park, J.....Malven.
Petty, W F.....Letart.
Prince, V B.....Warren.
Peyatt, M.....Academy.
Price, G W.....Arnoldsburg.
Queen, W.....Johnstown.
Queen. J L.....Bulltown.
Rickey, J W.....Glen Easton.
Rymer, H A.....Middlebourne.
Reger, J F.....Milo.
Richards, B F.....Pennsboro.
Riffer, s.....Jane Lew.
Roe, S S.....Sardis, Ohio.
Rymer, W M.....Harrisville.
Riddle, B F.....Big Bend.
Richardson, S M.....New Matamoras.
Roberts, E.....Lone Tree.
Rymer, M N.....Stouts Mills.
Richter, W E.....Glen Easton.
Rymer, J B.....Stouts Mills.
Rymer, F A.....Mannington.
Rusmissel, A P.....Frenchton.
Rhea, J L.....Flat Woods.
Russell, J R.....Nicholas C H.
Rader, A.....Enon.
Russell, S.....Charleston.
Rader, L A.....New Geneva.
Ricketts, G R.....Proctorsville.
Rogers, T R.....Moundsville.

Digitized by Google

Rutherford, E.....Logan C H.
Schuchardt, G.....Wheeling.
Sterling, T.....Burton.
Stiger, G A.....Cameron.
Stickler, E.....Shinnston.
Stutler, I.....Morgansville.
Shawley, W.....New Cumberland.
Swentzel, J P.....Grantsville.
Stutler, W P.....Kincheloe.
Stickling, W.....West Union.
Stone, T M.....Perie Grove.
Shoulders, A R.....Gaston.
Shoulders, C.....Gaston's Mills.
Safford, E D.....Parkersburg.
Stephens, S.....New Martinsville.
Shriver, J T.....Jolleytown, Pa.
Strasnider, T.....Blacksville.
Simon, G W.....Indian Camp.
Spangler, W H H.....Harper's Ferry.
Sperow, J.....Hanging Rock Mills.
Shields, A.....Salt Lick Bridge.
Stealton, M A.....Hewett, Boone co.
Saunders, E T.....Huntington.
Stroud, D W.....Mt. Hope.
Simmons, T W.....Jackson C H.
Southerland, J H.....St. Albans.
Samples, J J.....Malden.
Staunton, S S.....Charleston.
Staunton, J M.....Charleston.
Shain, S G.....Point Pleasant.
Seasholl, J.....Winfield.
Stovall, J Q.....Raleigh C H.
Stump, C E.....Newton.
Shumaker, H K.....Spencer.
Smith, J D.....Newton.
Slemaker, C.....Rollinsburg.
Scott, George.....Charleston.
Spencer, J W.....Linden.
Spurlock, J.....Hamlin.
Slemaker, C J.....Maysville.
Smith, P A.....Edray.
Swisher, N B.....Morgansville.
Todd, J M.....Bridgeport.
Thompson, J Col.....Parkersburg.
Thaw, R H.....Palestine.
Thomas, W H.....Grantsville.
Thompkins, J C.....Lubeck.
Troyhorn, J F.....Kasson.
Triplett, N H.....Laurel Iron Works.
Travis, J.....Forksburg.
Trumbo, G W.....Gallipolis.
Turner, W L.....St. Albans.
Thompson, J B.....Spencer.
Thomas, H.....Fayette C H.
Trader, J.....Robinson's Mills.
Tooley, G W.....Tooley.
Underwood, W.....Shirley.
Vincent, A.....Shinstown.
Vermillon, J R.....Concord Church.
White, W.....West Union.
White, J.....Hebron.
White, S C.....Grantsville.

Digitized by Google

Waite, J Y.....Arnoldsburg.
Welsh, T.....Pennsboro.
Wyatt, Z W.....Hepsville.
Williamson, J A.....Parkersburg.
Whitsill, J E.....Bethany.
Way, A C.....Boreland Mill.
Watson, S .....Dunkard, Penn.
Waugh, W J.....Troy.
Walker, S G.....Volcano.
West, Z M.....Evansville.
Warder, A S.....Pruntytown.
Walker, S A.....Grafton.
Warner, Rebecca.....Buckhannon.
Wilson, J S.....Burlington.
Wright, M F.....Burlington.
Williams, M D.....Moorfield.
Williams, R.....Edray.
Wright, E B.....Jackson C H..
Wagner, P.....Charleston.
Webb, J F.....Raleigh C H.
Williams, S.....New Richmond.
Waugh, J M.....Newton.
Wade, J C.....Burnsville.
Walker, N.....Egeria.
Wenzel, F.....Medley.
Waldron, M H.....Mouth of Pigeon.
Willis, C.....
Winston, W A.....Mopz, Fayette county.
Young, J.....New Moundsville.
Yokum, G W.....Beverly.

Digitized by Google

EXAMINED.

Names.	*Address.*
Aller, C W	Smithville.
Ackley, F M	Pt. Pleasant.
Ashberry, H F	Mason county.
Brannen, H C	Sardis, Ohio.
Bee, E	Berea.
Boyers, J S	Palatine.
Blair, A	Barracksville.
Bosworth, E T	Philippi.
Baker, N H	Fullersville.
Bowles, W S	Hamlin.
Bridges, N F	Mercer Salt Wells.
Barber, G P	Fayette C H.
Corbin, M L	Sugar Valley.
Campbell, T J	Rock Lick.
Courtney, D H	Worthington.
Cox, J A	Masontown.
Clelland, C M	Farmington.
Carr, C	Clay C H,
Carney, J M	Jackson C H.
Carter, G W	Reedy.
Cummings, W R	Hampton.
Cox, F B	Long Reach.
Dodson, E H	Glenville.
Dye, L J	Wirt C H.
Davison, J P	West Millford.
Davisson, L A	West Millford.
Dillon, J D	Braxton C H.
Darlington, J W	Salt Lick Bridge.
Dabney, I N	Beach Hill.
Eskay, L	Benwood.
Edgell, A M	New Milton.
Edgell, A W	Looneysville.
Ensminger, J E	Mannington.
Franklin, L S	Glenville.
Frankland, P L	Benton.
Fullerton, J L	Volcano.
Fitch, D P	Morgantown.
Flowers, A O	Prospect Valley.
Gibson, F	Freemansburg.
Grant, J P	Liberty.

Digitized by Google

Gary, R G.....St. Albans.
Gatewood, M M.....Copenhaver's Mills.
Griffin, M F.....Johnstown, Harrison Co.
Hudson, C W.....Rockport.
Hitchcock, C B.....Union Mills.
Haid, H S.....St. Clara.
Hall, J T.....Wellsburg.
Harr, H W.....Tunnelton.
Hall, J D.....Kingwood.
Hartman, J F.....Talbots.
Harper, R M.....Mouth of Seneca.
Hoffman, O H.....Keyser.
Hamilton, M F.....Mannington.
Holstein, J W.....Griffithsville.
Hurst, J C.....Breckenridge.
Houston, J B.....Huntington.
Hutchinson, W.....Jackson C H.
Hensley, G B.....Pt. Pleasant.
Heisman, C C.....Weston.
Hunter, J W.....Raleigh C H
Hudgins, C L.....Logan C H.
Hervonkohl, A.....Barboursville.
Jackson, J D.....Moundsville.
Ice, C H.....Grandville.
Jones, J A.....Ripleys.
Jamison, W C.....Princeton Mills.
Jarvis, J W P.....Barnettsville.
Jacobs, C C.....Arnettsville.
Judy, N J.....Mount Freedom.
Jamison, J A.....Buceton Mills.
Kennedy, J S.....Lost Creek.
Keer, W. D.....Upland.
Lowther, F P.....New Martinsville.
Lemley, W H.....Uniontown.
Lawrence, R.....Kinchelva.
Love, E L.....Grafton.
Latham, A P.....Mount Pleasant.
Lowther, J G.....Wirt C. H.
Lowe, J A.....Rockport.
Martin, T C.....Cairo.
Manley J R.....Queen's Mills.
Mitchell, A J.....Burning Springs.
Matlock, S.....Raleigh C. H.
Mairs, A T.....Sissonville.
Mossman, E J.....Point Pleasant.
Morgan, G W.....Monongalia County.
McIntire, G L.....Wileysville.
McComas, J.....New Martinsville.
McGumphy, N G.....Rock Lick.
McCollum, J L.....Little's Mills.
McKinley, F.....Freemansburg.
McIlvain, J.....New England.
McDowell, J W.....Romney.
McGee, F L.....Nicholas C. H.
McGill, C.....Winfield.
Nihiser, W M.....Hartmansville.
Nash, H A.....Charleston.
Phillips, W L.....Moundsville.
Peck, Nelson.....Grassland.
Potts, D E.....Walkersville.
Parkes, L.....Conaway.
Plummer, G T.....Rowlesburg.

Digitized by Google

Pratt, S A.....Kingwood.
Park, A W.....Malden.
Parsons, T J C.....Rockcastle.
Pardue, W H T.....Hamlin,
Parsons, A R.....Spencer.
Palmer, F.....New Dale.
Putney, J.....Malden.
Ross, A M.....East Liverpool.
Raun, H B M.....Berkeley Springs.
Robinson, G F.....Buffalo.
Rine, E W.....Letart.
Short, J M.....West Liberty.
Simonton, W S.....Cameron.
Summers, J D.....Jane Lew.
Still, W S.....Deer Walk.
Smith, D C.....Little's Mills.
Shuman, P E.....Glover's Gap.
Sutton, E K.....Gladesville.
Shafer, J P.....Independence.
Shull, J W.....Pleasant Dale,
Stillyard, B H, Col.....Washington, D C.
Stamp, J L.....Copenhaver's Mills.
Stuart, D S.....Rosencamp.
Sutherland, J H.....St. Albans.
Sayer, J B.....Jackfon county.
Sidell, P A.....Willow Island.
Scott. J W.....Bruceton Mills.
Schevznn, J.....Wheeling.
Sibley, R B.....Wheeling.
Tanzey, E A.....Morgantown.
Talbott, J S.....Belington.
Trask, W J.....Williamsport.
Taylor, J A.....Hamlin.
Teagardner, M V.....Willow Island.
Thornburg, J H.....Yorkville.
Thrasher, J D.....Red Sulphur Springs.
Vickers, R E.....Griffithsville.
Woodruff, W H.....Rock Lick.
Wayt, W D.....Rarby's Rock.
Walker, J W.....Troy.
Wilson, L L.....Grafton.
Whelan.....Roanoke.
Wetzel, J H.....Ravenswood.

Digitized by Google

LOCAL BOARDS OF HEALTH.

Section sixth Amended Acts of 1887, chapter sixty-four, reads as follows:

It shall be the duty of the county court to nominate and the State Board of Health to appoint in each of the counties of the State three intelligent and discreet persons residing therein, two of whom shall be citizens and one a physician qualified to practice medicine under the provisions of this chapter. And the persons so appointed shall, with the president of the county court and Prosecuting Attorney for the county, constitute a local board for the county of their residence, and they shall hold their office for two years, and until their successors are appointed, unless sooner removed from office by the State Board of health. The physician of the local board shall be the executive officer of the board and the health officer of the county; and he shall out of the treasury of the county receive a yearly salary, to be fixed by the county court, and the other members of the local board shall be paid their expenses when actually employed; vacancies in said local board shall be filled by the State Board of Health for the unexpired terms upon the nomination of the county court. The said local board of health shall make and establish for their county, or for any district, or place therein, such sanitary regulations or rules as they may deem necessary and proper to prevent the outbreak and spread of cholera, small pox, scarlet fever, diphtheria and other endemic or epidemic, infections and contagious diseases, and they, or any of them may, except in the night time, in the performance of the duties imposed upon them, enter into or upon any house or premises and inspect the same, whenever they have reason to believe that such house or premises is in an unclean or infectious condition; and if any house or premises so inspected is found in such condition as aforesaid, said local board shall direct and require the person in charge of, or occupying the same, if of sufficient means, to cleanse and purify the same ac-

Digitized by Google

cording to the sanitary rules and regulations made by said board as aforesaid; and if any such person shall fail or refuse to comply with and obey the said directions and requirements of said board, he shall be guilty of a misdemeanor and fined not less than ten nor more than 100 dollars. Such local board shall enforce within their county all the lawful rules and regulations of the State Board of Health applicable to such county. It shall be the duty of practicing physicians in any county in which there is such local board of health to report promptly all or any diseases of the above named character under treatment by him, and said local board shall once at least in every three months report to the State Board of Health the character of all such infectious, contagious, endemic and epidemic diseases; the number of persons reported as infected with said diseases; the action taken by the local board to arrest the progress of every such disease, and the visible effects, if any, of such action. The following rules and regulations are suggested for the adoption and guidance of local boards of health:

The board of health of each county shall meet quarterly, on the first Wednesday after the first Monday of January, April, July and October.

REGULATIONS CONCERNING SPECIAL NUISANCES, SUGGESTED FOR THE ADOPTION AND GUIDANCE OF LOCAL BOARDS OF HEALTH.

Privy-Vaults, Cesspool and Drains.

RULE I. No privy-vault, cesspool or reservoir, into which a privy, water closet, stable, or sink, is drained, except it is water-tight, shall be established or permitted within —— feet of a well, spring, or other source of water used for drinking or culinary purposes, without written permission of the local board of health, based upon the advice of the health officer of the board. Earth closets, or earth privies, with no vault below the surface of the ground, may be excepted in this rule, by written permission of the board of health, but sufficient dry earth or coal ashes must be used daily to absorb all that part of the deposit. The entire contents must be removed when necessary.

[*Note*—The positive evidence of the infection of water from such sources is so abundant and conclusive that no question of the importance of this regulation can be entertained. The blank respecting distance should be varied in different places, according to the nature of the soil as respects porosity and the formation of the substrata, but in no case should be less than fifty feet. Dry earth and coal-ashes are efficient disfectants, if used in sufficient quantity. Wood ashes are very inferior disinfectants.]

RULE II. All privy-vaults, cesspools or reservoirs named in Rule I. shall be cleaned out at least once a year, between the 1st day of November and the 1st day of April, and not at other seasons except by written permission of the local board of health, and

Digitized by Google

under such restrictions as the board of health may prescribe. And from the 1st of April to the 1st of November every privy-vault and cesspool in the district shall be thoroughly disinfected by adding to the contents thereof, twice every month, two pounds of copperas dissolved in a large pailful of water.

RULE III. All sewage drains that pass within fifty feet of any source of water supply for drinking or culinary purposes shall be watertight, and in sandy and porous subsoil the limit shall be one hundred feet, and all drains shall be watertight for a distance of not less fifty feet from any occupied dwelling, workshop or place of business.

RULE IV.—No sewage drain shall empty into any stream, lake, pond or other source of water used for drinking purposes, or for ice supply, or into any standing water, within the jurisdiction of this Board.

RULE V.—No person shall keep and maintain upon his premises at any time, any privy, water-closet, cesspool, sink, drain or other like receptacle, except in a cleanly and inoffensive condition.

Regulations Concerning Garbage.

RULE VI.—No person permit the accumulation in or around the immediate vicinity of any dwelling house or place of business under his control, of surface matter, such as swill waste of meat, fish or shells, bones, decaying vegetables, dead carcasses, or any kind of offal, until decomposition may generate unhealthy gasses and possibly propogate disease germs.

RULE VII.—No person shall throw, dump or deposit any filth, garbage, decaying animal or vegetable matter, which may become prejudicial to public health, upon any vacant lot, highway, park, or public place. This does not preclude the proper use of fertilizers.

RULE VIII.—No person shall throw, dump, or deposit any offal, or other offensive substances, or the carcass of any animal into any stream, brook, canal, flum, raceway, lake, pond, spring, or into any catch basin or street gutter, within the jurisdiction of this Board.

Regulation Concerning Food.

RULE IX.—No article of food or drink intended for human use or consumption, nor any article which may be used in the composition or preparation of such food or drink, not being then healthy, fresh, sound, wholesome, fit and safe for such use; nor any animal or fish that died by disease or accident, or was slaughtered while diseased; and no carcass of any calf, pig or lamb, which at the time it was slaughtered, was less than four weeks old, and no meat therefrom shall be brought within the limits of the county of ——, or offered or held for sale or sold as food any where in said county of ——.

Regulations Concerning Contagious Diseases.

RULE X.—Every householder within the limits of the county

Digitized by Google

of ——, in whose dwelling shall occur a case of small pox, scarlet fever, diphtheria, typhoid fever, typhus fever, Asiatic cholera, or yellow fever, shall immediately notify the local board of health of the same. Until instructions are received from said board or its authorized officers, clothing or other property that may have been exposed to the infection of small pox, scarlet fever, diphtheria, or typhus, fever shall not be removed from the house; nor shall any occupant of a house in which any of these diseases are present, change his residence elsewhere, without the consent of the said board, during the prevalence of any public danger from any such disease.

RULE XI.—Every physician who shall have prescribed for or attended any person having any of the diseases named in Rule X, shall forthwith report to this Board in writing, the name, age and address of such persons, also the school at which he or she attends, or shop or factory in which he works; and every attending physician shall report in writing to this Board the name, age and address of every person who shall have died of any said infectious disease, and this report shall be in addition to the certificate of death required for the Registrar.

RULE XII.—No superintendent, principal or teacher of any school, and no parent or guardian of any child attending school shall knowingly permit a child sick with small pox, scarlet fever, diptheria, measles, whooping cough, scaties or typthus fever, to attend school, nor shall any child residing in a house in which disease shall exist be permitted to attend school without a written permit from the local board of health.

RULE XIII.—No person shall hinder or prevent the Board of Health from securing the isolation of any person sick with a contagious disease; the disinfection of any premises or articles which have been exposed to infection; or the using of any methods or means it may deem proper to control the spread of contagious diseases.

RULE XIV.—It shall be the duty of the Health Officer, whenever informed that any person is sick with small pox, diphtheria, scarlet fever, typhoid fever, typhus fever, asiatic cholera, or yellow fever, without delay to give such instructions and orders to those in charge of the sick person with regard to isolation of the sick, disinfection and other necessary precautions, both during the progress of the disease and after recovery, or death, as will best insure the safety of the public.

RULE XV.—To wit: It shall be sufficient notice to all persons of any regulations of this Board, if it be published in a newspaper in the county, or publicly posted for three days on the front of the court house of the county of ——————: and if any person shall willfully violate such rules after they have been published or posted, or after actual notice thereof shall have been given him, he shall forfeit not less than ten, nor more than fifty dollars.

Digitized by Google

COUNTY BOARDS OF HEALTH.

BARBOUR.

DR. J. W. BOSWORTH.....Phillippi.
DR. S. S. RODERICK.....Phillippi.
F. S. BYER.....Phillippi.

BERKELEY.

DR. J. W. McSHERY.....Martinsburg.
M. S. GRANTHAM.....Shanghai.
E. HOFFMAN.....Bunker Hill.

BOONE.

DR. JOHN M. THOMPSON.....Madison.
F. D. MITCHELL.....Madison.
J. C. EDELMAN.....Peytona.

BRAXTON.

DR. W. P. NEWTON.....Braxton C. H.
JOHN G. MORRISON.....Braxton C. H.
JOHN S. GARET.....Braxton C. H.

BROOKE.

DR. W. K. CURTIS.....Bethany.
HENRY HAMMOND.....Wellsburg.
JAMES ARCHER.....Steubenville.

CABELL.

DR. D. W. DABNEY.....Guyandotte.
C. R. SUMMERS.....Milton.
WILSON ROGERS.....Barboursville.

DODDRIDGE.

DR. L. R. CHARTER.....West Union.
A. C. HOLMES.....West Union.
J. V. BLAIR.....West Union.

FAYETTE.

DR. L. B. RUPERT.....Nuttalls.
DR. C. S. HOOVER.....Brownstown.

Digitized by Google

GILMER.

DR. A. J. WOOFTER.....Troy.
J. S. DAVIDSON.....Troy.
CARY MOLLOHAN.....Troy.

GRANT.

DR. J. F. SCOTT.....Medley.
E. G. VOSSLER.....Mount Storm.
B. J. BAKER.....Petersburg.

GREENBRIER.

DR. C. H. AUSTIN.....Lewisburg.
JOHN H. CRAWFORD.....Lewisburg.
A. G. HANALY.....Lewisburg.

HAMPSHIRE.

DR. B. F. BERKELEY.....Romney.
JOHN MONROE.....Romney.
JOHN SARGEANT.....Romney.

HANCOCK

DR. P. C. McLEAN.....New Cumberland.
JOHN R. SCOTT.....Fair View.
SAMUEL F. ROSE.....East Liverpool.

HARDY.

DR. WM. B. BROWN.....Moorefield.
B. W. McKEEVER.....Moorefield.
SEYMOUR DASHER.....Moorefield.

HARRISON.

DR. B. F. McKEEHAN.....Clarksburg.
B. T. HARMER.....Clarksburg.
WALTER McWHARTER.....Clarksburg.

JACKSON.

DR. W. W. KIDD.....Jackson.
DR. B. E. HARRISON.....Sackson.
DR. B. H. HOYT.....Ravenswood.

KANAWHA.

DR. FRED S. THOMAS.....Charleston.
GEORGE H. DANA.....Charleston.
E. W. CLARK.....Charleston.

LEWIS.

DR. CHAS. SMITH.....Gaston.
T. W. HOUTON.....Weston.
M. W. HARRISON.....Weston.

LINCOLN.

DR. W. S. BOWLES.....Hamlin.
W. M. WORKMAN.....Hamlin.
J. D. SMITH.....Hamlin.

LOGAN.

DR. JAMES MITCHELL.....Chapmansville.
DR. C. S. HUDGINS.....Court House.
DR. G. W. LAWSON.....Mouth of Sycamore.

Digitized by Google

MARION.

DR. G. H. BROWNFIELD.....Fairmont.
W. E. PARKER.....Fairmont.
C. A. PRITCHARD.....Fairmont.

MARSHALL.

DR. H. T. FORD.....Benwood.
J. W. DUNLEARY.....Cameron.
T. W. MANNING.....Moundsville.

MASON.

DR. ARCHIBALD CRARY.....Hartford City.
J. W. ENGLISH.....Point Pleasant.
W. R. GUNN.....Point Pleasant.

M'DOWELL.

DR. NED JEDER.....Elk Horn,
DR. W. R. IAEGER.....Iaeger.
J. F. JOHNSON.....Perrysville.

MERCER.

DR. A. H. CARR.....New Hope.
H. B. BARBER.....New Hope.
J. W. HALE.....New Hope.

MINERAL.

DR. T. H. WEST.....Keyser.
J. P. A. ENTTER.....Keyser.
J. P. CARSKADAN.....Keyser.

MONONGALIA.

DR. L. S. BROCK,.....Morgantown.
J. C. WHITE,.....Morgantown.
DR. E. H. COOMBS,.....Morgantown.

MONROE.

DR. H. M. BROWN,.....Union.
LEWIS CALLOWAY,.....Union.
GEORGE ALDERSON,.....Union.

MORGAN.

DR. E. B. PENDLETON,.....Berkeley Springs.
LEWIS SARGEANT,.....Berkeley Springs.
G. F. WEBER,.....Berkeley Springs.

NICHOLAS.

DR. M. R. HEREFORD,.....C. H.
DR. A. RADER,.....Enon.
DR. RUFUS McCUTCHIN,.....Winston.

OHIO.

DR. E. C. MYERS,.....Wheeling.
MICHAEL STEIN,.....Wheeling.
LEWIS KRAFT,.....Wheeling.

PLEASANTS.

DR. J. P. BRADFORD,.....St. Marys.
DR. J. B. WATSON,.....St. Marys.
J. D. KNIGHT,.....St. Marys.

Digitized by Google

POCAHONTAS.

DR. JNO. LIGAN,.....Huntersville.
J. C. ARBOGAST,.....Huntersville.
F. A. REMICK,.....Huntersville.

PRESTON.

DR WM. FRY,.....Brandonville.
DR S. M. SCOTT,.....Cranberry.
DR. R. B. L. TRIPPETT.....Kingwood.

RALEIGH.

DR. W. M. OVERTON,.....C. H.
JESSIE C. HURET,.....C. H.
JOEL S. LEWIS,.....C. H.

RANDOLPH.

DR. HUMBERT YOKUM,.....Beverly.
S. H. KNOTE,.....Lick.
WM. A. MOORE,.....Huttonsville

RITCHIE.

DR. W. E. TALBOTT,.....C. H.
A. RUTHERFORD,.....Cairo.
P. R. THORPE,.....Cairo.

ROANE.

DR. A. G. BAILY,.....Spencer.
E. M. RIDDLE.....Spencer.
MARSHALL DEPEW,.....Spencer.

TAYLOR.

DR. W. L. GRANT,.....Grafton.
DR. A. S. WARDER,.....Grafton.
DR. SCOTT A. HARTER,.....Grafton.

TUCKER.

DR. B. BAKER,.....St. George.
DR. J. W. JOHNSON,.....Davis.
JOHN L. ADAMS,.....Davis.

TYLER.

DR. W. H. GILLESPIE.....Sistersville.
O. W. D. HARDMAN.....Sistersville.
D. D. JOHNSON.....Sistersville.

UPSHUR.

DR. R. A. REGER.....Buckhannon.
C. J. McKINDLY.....French Creek.
D. O. B. HALL.....Swamp Run.

WAYNE.

DR. J. A. TAYLOR.....Court House.
G. T. RATTLIFF.....Court House.
C. F. FERGUSON.....Court House.

WEBSTER.

DR. C. A. DRODDY.....Addison.
T. M. DALY.....Court House.
ROBERT H. TOWNSEND.....Court House.

Digitized by Google

WIRT.

DR. J. G. LOWTHER.....Court House.
C. S. MANNING.....Court House.
O. C. MORRIS.....Court House.

WOOD.

DR. L. C. HUNT.....Parkersburg.
H. C. HENDERSON.....Williamstown.
H. C. PENNYBACKER.....Belleville.

WYOMING.

DR. A. J. WOODS.....Oceana.
H. BLANKENSHIP.....Oceana.
FLOYD LUSK.....Oceana.

Digitized by Google

REPORT FROM LOCAL BOARDS OF HEALTH.

NICHOLAS C. H.,
August 8, 1888.

DR. N. D. BAKER:

DEAR DR.:—I have been a little careless, as well as some other physicians, in making reports. I will now attempt to report the most prevalent diseases in our county within the last three months. From May the 1st to August the 11th, with but few deaths, the most prevalent disease has been cholera infantum and cholera morbus, with some cases of malignant dysentery, of which some died. At present their appears to be a fever of a remittent form prevailing. I have met with but one case of typhoid fever in the time above mentioned. The above disease prevailed most extensively during the dry weather and low water. The health of the county is improving.

Very respectfully,

M. K. HEREFORD.

WELLSBURG, W. VA.,
August 13, 1888.

DR. N. D. BAKER,
Secretary State Board of Health:

DEAR DR.:—Yours of recent date to hand. I made a report to Dr. Harris the last part of May. There was not much to report then, nor is there much at this time. For a year past there has not been an epidemic, either amongst our people or animals in this county. There have been a few cases of typhoid fever and of the contagious diseases of children, but all such disease have been less prevalent than for several years past. The general sanitary condition of this county has been good.

When I reported to Dr. Harris last I examined the books in the county clerk's office. I found that six of the physicians in the county had not even registered; none of them had made a single return of births or deaths. The county clerk pays little or no

Digitized by Google

attention to the matter. He is not very much pleased over the fact that he only receives two cents for recording each name and keeping nice and accurate books. When the discovery was made that no provision was made in the amended law for furnishing blanks, I tried to get our board of commissioners to have them printed. They had the clerk write the Attorney General (the Hon. Alfred Caldwell) and received information that the law gave them no authority to do so; "ergo," they would not do it. I did not feel able to do it myself, as I have never received any pay for anything I have done. I have been president, secretary, general worker, and everything else of the Brooke county board of health ever since the law went into effect. I can safely say that the people of the county are educated up to an understanding of sanitary matters and are encouraging the county board in their endeavors.

Our commissioners are very peculiar in their ideas and non-possession. The clerk of the county court can not visit the penalty on the profession for not reporting, as the law required that blanks be furnished them, which has not been done.

Yours, very truly,

W. K. CURTIS, M. D.

ADDISON, WEBSTER COUNTY, W. VA.
August 15th, 1886.

DR. N. D BAKER,

Secretary State Board of Health,

DEAR DR.:—The records of our county having been destroyed by fire in June last, I am unable to refer to reports of the physicians for information respecting diseases in our county. Webster is the healthiest county in the State; thus far in the present year there has not been a case of diptheria, scarlet ar malarial fever in the county; perhaps half a dozen cases of pneumonia and a few cases of rheumatism.

The sanitary condition of our county has improved very much in the last few years. Our local board of health are alive to their duty, our people responding readily to the suggestions of our health board. Our commissioners are liberal in their aid of sanitary work.

The principal source of disease in our county, which is without factories, slaughter houses, &c., are cow yards, stables, hog pens and privies, most of them close to the dwellings, and frequently contaminating the spring or general water-supply. Diptheria has frequently been traced by the above named causes. With our natural advantages and proper sanitalion diptheria, dysentery, scarlet fever &c., ought to be unknown in our midst.

Respectfully,

CHAS. A. DRODY,
President Local Board of Health.

Digitized by Google

OCEANA, W. VA.
August 28th, 1888.

DR. N. D. BAKER,
Martinsburg, W. Va.

DEAR DR.:—Your letter citing me to the duties of local boards of health duly received, and would have been answered sooner but for my absence from home.

As to contagious and infectious diseases I have two cases of diptheria under treatment at this time, I have heard of several other cases in the county, but have not received any official report of them. We have had a great many cases of dysentery in the county. There have been several death from it, but none in my own practice. Our county has not fixed the salary of the local health officer as required by law.

Yours very truly,

O. J. WOODS,
Secretary Local Board of Health.

PHILLIPI, W. VA.,
June 15, 1888.

DR. T. A. HARRIS,
Parkersburg, W. Va.

DEAR SIR:—I very much regret my inability to make an acceptable and satisfactory report of the sanitary condition of Barbour county, by the time fixed in your request, and for the reason that, first, your letter was not received until the middle of May, when I was very busy professionally, furthermore, at that time I was called from home on account of the sickness and death of a sister, taking up the intervening time, from the reception of your letter to the present time.

But so far as my knowledge of the general sanitary condition of the county goes for the past year, it has been very good. During the latter part of last Summer and Fall, we had a number of cases of typhoid malaria fever, scarcely a case however proving fatal. During the winter months measels prevailed in the eastern part of the county, from which there were several deaths, but they were the result of such complications as bronchitis and pneumonia, within some instances ignorance on the part of attendants as to the proper modes of nursing; with these exceptions the county has been particularily healthy.

The sanitary condition of our jail has not been good but soon will be, the county court having ordered the changes necessary to effect it. Our school houses will compare favorably with those of any county in the State; an eye has been kept in their erection to proper ventilation, &c.

Very Respectfully,

J. W. BASWORTH, M. D.,
President Local Board of Health.

Digitized by Google

LOGAN C. H.,
June 15, 1888.

DR. T. A. HARRIS,
Parkersburg, W., Va.,

DEAR DR.:—The sanitary condition of Logan county is probably in a better condition than it ever was. The prevailing diseases during the past year have been Intermittent and Remittent feavers. Pneumonia and an occasional case of typhoid fever, quite unusual in this valley. We had several cases of acute articular rheumatism during the past winter. The above are the prevailing acute diseases. We have at the same time the usual amount of chronic troubles.

At this writing there is less sickness here than at any time in the last ten years. The sanitary condition of our jail is bad to say the least, there is no ventilation beneath, and the floor is built on the ground. The base of the windows is four feet above the floor, and the cells are so planned as to prevent a free circulation of air between the windows, the result is that all the foul air generated in the jail must remain. We have no poor house. Our county commissioners sell the privilege of supplying the poor to the lowest bidder and they submit. Therefore they are scattered almost all over the county, wherever they will be kept.

We have ninety-three school houses in the county built of hewn logs, about one half heated by stoves, the other half heated by open fire places, stone chimneys and wood fires. The floors are almost on the ground, and the ceilings are quite low just sufficient for a tall man to stand erect, the windows are small and few in number, ventilation very bad.

Very respectfully,

C. L. HUDGINS,
President County Board of Health.

CLARKSBURG, W. VA.,
May 20, 1888.

DEAR DR.:—In answer to yours of May 12th I can only say that we have had no epidemic in the county during the last year. A few scattering cases of typhoid fever, diphtheria, pneumonia, measles, etc., catarrhal troubles being the most frequent, from which we are never free. There is, however, one locality in the county extending along a small creek for a distance of four miles near the village of Mt. Clare, on the Clarksburg and Weston Railroad, six miles south of Clarksburg, that has not been free from one or more cases of typhoid fever in a mild form for several years.

The sanitary condition of jail and school houses in town is good and from what I see of the county school houses I think their sanitation is fair. The gentleman in charge of the county almshouse assures me that the sanitary condition is good. Sickness less than for years past. Respectfully,

J. W. BOWCOCK.

Digitized by Google

GASTON, W. VA.,
May 29th, 1888.

DEAR DR. HARRIS:—In compliance with your request, I have the honor to submit the following report. It is imperfect from the fact that I have been compelled to rely upon my own knowledge of the sanitary condition of the county, and of the prevalent diseases. Have not received a formal report from a single physician in the county. The sanitary condition of the county is good, quite up the average of other counties in the State. In and around Weston the Asylum sewer is a cause of complaint and I think justly so, do you not think something should be done to correct the evil?

The prevalent diseases through the winter were pneumonia and catarrhal troubles, with a few cases of typhoid fever, the winding up of an epidemic which existed last fall in that part of the county along Freeman's and Kinchelor's creeks, the latter divides Lewis and Harrison counties.

There have been two cases of scarlet fever recently in Weston, with one death. The local board of health acted promptly, had the bed and clothing of the fatal case burned, and the premises thoroughly disinfected. The case was that of a child attending the public school, the school was immediately closed; the other case was next door to the first, a woman married and without children. This case recovered.

Our county recently built a jail at a cost of $6,000. There has been no complaint, although I think the construction was more with a view to security than sanitation. The poor of the county are kept on a farm. The buildings are log cabins with open fireplaces. They are often overcrowded.

The school houses of our county are substantial frame buildings heated by stoves, ventilation accomplished by lowering or raising of windows. The light is admitted from both sides of the house and the windows are guiltless of blinds. There is much complaint of headache among the children.

Yours, truly,

C. W. SMITH,
Secretary Local Board of Health.

KEYSER, W. VA.,
May 30, 1888.

DR. T. A. HARRIS,
Parkersburg, W. Va.:

DEAR SIR:—During the past summer months typhoid fever was more prevalent than usual. I think a number of cases were caused by well-water contaminated by surface drainage. There have been no cases since the first of the present year.

Diphtheria has been unusually prevalent. We had a large number of cases in this town and along the Potomac river, but the most malignant cases were met with on the summit of the Alleganies. In the months of August, September, October and

Digitized by Google

November it was generally prevalent. There have been but few cases since December. An epidemic of measles prevailed throughout the county during the fall, winter and spring.

Yours, truly,

T. H. WEST.

BEVERLY, W. VA.,
June, 1, 1888.

DEAR DR.:—The sanitary condition of our county in general is good. There is no system of sewage in this town, getting rid of fecol excrument gives us a great deal of trouble. There was an epidemic of typhoid fever in and around Beverly last September and October, the death rate was light in proportion to the number of cases. Measles have prevailed in epidemic form all over the county since December, 1887.

The sanitary condition of our jail and county houses is good. School houses as a general thing are badly ventilated.

Very truly yours,

H. YOKUM,
President Local Board of Health.

GRAFTON, W. VA.,
June 1, 1888.

DEAR DR.:—As execution officer of local board of health for Taylor county, I herewith send my report as indicated in your communication, I had hoped to receive blanks for this purpose.

I have pleasure in having to report the prevalence of no endemic or epidemic in this county, except measles to some extent in Knottsville district, where some few deaths occurred.

The sanitary condition of the county is fair, though not first-class. The condition of all our public buildings is as good as their faulty construction will permit.

I felt not a little disappointed in that our last Legislature failed to amend the most important feature of the health law, viz: The indirect and futile way of prosecuting violations of the law. Why did they not make these violations of law cognizable before a Justice of the Peace.

Respectfully,

W. L. GRANT.

SISTERSVILLE, W. VA.,
October 2, 1888.

HON. N. D. BAKER,
Secretary State Board of Health.

DEAR SIR:—In reply to your request asking for a full report, concerning the two cases of small pox, of recent date at Stringtown, opposite Sistersville, West Virginia, I have the honor to make the following report:

On the 31st day of July 1888, John A. Davenport, President of the County Court of Tyler county West Virginia, came to my

Digitized by Google

house and informed me that he understood that there was a suspicious case of sickness at the house of one Cain, a saloon-keeper in Stringtown, and suggested the propriety of my making an examination, and if the disease should prove to be of an infectious nature to do whatever would seem to be proper under the circumstances to protect our citizens from contagion. I went over the river, examined the patient, and being of the opinion that it was a case of small pox, I immediately ordered quarantine against the Ohio side for a space of two miles up and down the river, opposite our place, and to better enforce said quarantine I employed four guards at night, and four by day, to watch and prohibit intercourse, and I also stopped the U. S. Mail between our place and Stringtown. The authorities at the City of Washington, promptly complied with the terms of said quarantine, and so instructed the mail carrier and P. M., but when I first examined the case over the river, the family had a man in attendance by the name of Stewart, who although a doctor in active practice, denied the fact of the patient having small pox, and insisted that it was a case of erysipelas, and some of the neighbors pronounced it a case of rash brought about by eating too many blackberries.

So much diversity of opinion caused a good deal of opposition to the quarantine, and made the enforcement of it up hill work for me, but nevertheless, I went ahead and did my duty regardless of consequences.

I made repeated attempts to get the Ohio authorities to take cognizauce of the case, but not until a second case had happened and nearly got well, did they notice the matter, and their delay in the matter was the means of costing our county some unnecessary expense, but which, considering the danger to which our citizens were exposed, I think was a very judicious investment. The second case took place some time later and after the first quarantine had been removed a few days, and as the second case was confluent from head to foot, it soon removed any difference of opinion about the nature of the disease, and I had no further trouble on that score. I was also very cordially sustained in my official duties in the matter, not only by the State Board of Health, but also by our local board of health of Tyler county. Quarantine has been raised some weeks ago, and everything is now quiet.

With high respect,

Wm. H. Gillespie, M. D.
Health Officer, Tyler county, W. Va.

Digitized by Google

STATE vs. RAGLAND

SUPREME COURT OF APPEALS OF W. VA.

September 15, 1888.

Writ of Error to the Circuit Court of Boone county.

Opinion by JOHNSON, President:

SYLLABUS.

1. Sec. 14 of Chap. 150 of the Code prohibits an itinerant physician from practicing medicine, an itinerant vendor of drugs and from selling such drugs &c., or any one buy any drug, nostrum, &c., from treating diseases without first paying the special tax required by the section.

2. An indictment containing but one count which charges that therein, that the defendent did all of the things prohibited by the statute without paying the special tax required, is a good indictment.

3. On the trial of the issue on such an indictment, held, that proof that the defendant was an itinerant vendor of drugs, sustained the indictment and the general finding of guilty would not be set aside.

State of West Virginia,

VS.

J. B. Ragland.

OPINION.

J. B. Ragland was on the 17th day of October, 1887 in the cir-

Digitized by Google

cuit court of Boone county, indicted as an itinerate physician and vendor of drugs, &c. The indictment is as follows:

"The jurors of the State of West Virginia in and for the body of the County of Boone, and now attending the said court, upon their oath, present, that J. B. Ragland, on the first day of October, 1887, in the said county, was an itinerate physician and then and their publicly professed to treat diseases, injuries and deformities and he, the said J. B. Ragland then and there was an itinerant vendor of certain drugs, nostrums and ointments with which he, the said Ragland then and there publicly professed to cure and treat diseases, injuries and deformities and he, the said J. B. Ragland then and there to-wit; at the county aforesaid on the day and year aforesaid as such itinerant physician and as such vendor of such drugs, nostrums, ointments and patent medicines as aforesaid, did practice and attempt to sell such drugs, nostrums, ointments and patent medicines and did then and there practice his business as such vendor of said nostrums, drugs, patent medicines and did then and there practice and attempt to practice in said county without then and there having paid the special tax required by law, and without having filed with the clerk of the county court of said county a receipt of the sheriff of said county showing the payment of such tax, and without then and there having a license to act as such itinerate physician and vendor of patent medicine, drugs, ointments and nostrums against the peace and dignity of the State."

The defendant demurred to the indictment which demurrer was overruled, and the defendant pleaded not guilty. The defendant waived a jury and the evidence was heard by the court in lieu of a jury, who after hearing the evidence found the defendant guilty, and assessed his fine at $100, thereupon the defendant moved the court to set aside the finding, and grant him a new trial because the finding was contrary to the law and evidence; the court overrulled the motion; the defendant then moved in arrest of judgment, which motion the court also overruled, and entered judgment against the defendant for $100 fine and costs. The evidence is all certified, in the bill of exceptions to the refusal of the court to set aside the finding and grant a new trial. To the judgment the defendant obtained a writ of error. The first error assigned is overruling the demurrer to the indictment. The indictment above set forth was found under Sec. 14, Chap. 150, paga 915, of the code. The section is as follows:

"Any itinerant physician, desiring to practice medicine in this State, or any itinerant vendor of any drug, nostrum, ointment or appliance of any kind, intended for the treatment of disease, or injuries, or who shall by writing or printing, or in any other method, publicly profess to cure or treat diseases, injuries or deformities, by any drug, nostrum, manipulation or other expedient, shall before doing so pay to the sheriff of every county in which he desires to practice, a special tax of fifty dollars for each month or fraction of a month he shall so practice in such county and

Digitized by Google

take his receipt in duplicate therefor. He shall present said receipts to the clerk of the county court of such county, who shall file and preserve one of them in his office, and shall endorse on the other words 'a duplicate of this receipt has been filed in my office,' and sign the same; and if any such physician or vendor of patent medicines, shall practice or attempt to practice in any such county without having paid such tax and filed such receipt with the clerk of the county court, and obtained his endorsement on the other as aforesaid, or if he shall practice or attempt to practice for a longer time than that for which he has paid such tax as aforesaid, he shall be guilty of a misdemeanor, and shall be fined not less than one hundred nor more than five hundred dollars. Any person who shall travel from place to place, and by writing, printing or otherwise, publicly profess to treat or cure diseases, injuries or deformities, shall be held and deemed to be an itinerant physician, and subject to the taxes, fines and penalties prescribed in this section."

This is a very crudely drawn statute. Its provisions are by no means clear; but we think we understand what was intended by the statute. It is clearly intended to prevent itinerent physicians from going from county to county in the State and practicing medicine without they should pay the heavy tax prescribed in each county, which undoubtedly was intended to prohibit such practice. It was also intended to prevent any one, whether a physician or not, from traveling from county to county vending drugs, nostrums, ointments or appliances of any kind intended for the treatment of diseases or injuries, unless the special tax were paid; or to prevent any one who should by writing or printing or in any other method publicly profess to cure or treat diseases injuries or deformities by any drug, nostrum, manipulation or other expedient from doing so until he should pay the special tax imposed. Therefore it seems the statute was intended to reach the itinerant physician, the itinerant vendor of drugs, &c., and any one, physician or not, who shall by writing or printing, or in any other method, publicly profess to cure or treat diseases, injuries and deformities by any drug, nostrum, manipulation or other expedient, and practiced what he professed to do. By this statute any one, and all persons are prohibited from doing anything mentioned therein or pertaining to either of the three classes, without first paying the special tax prescribed.

This indictment in one count charges the defendant with doing all three of the things prohibited, without first paying the special tax. Can all these things be properly charged in one count? The plaintiff in error insists that they cannot be so charged in the same count, and that the count is fatally defective, and cites *State vs. Gould*, 26 W. Va., 258. That case is utterly unlike this. That was an indictment for cruelty to an animal. This is a revenue case, where the pleading is much more liberal to advance the remedy and prevent the evil. This is much more like an indictment for selling spirituous liquors, &c., without a license therefor.

Digitized by Google

Section one of chapter thirty-two of the code, among other things, provides that "No person without a State license therefor shall sell, offer, or expose for sale, or solicit or receive orders for, or keep in his possession for another, spirituous liquors, wine, porter, ale or beer, or any drink of like nature."

It is not doubted that if an indictment in a single count should charge that the defendant did all these things, the indictment would be good and the proof of his doing any one of them without the license to sell, would be sufficient to convict him; and if the proof was he did one or all of them, a State license to sell the spiritueus liquors, &c., would be a perfect defence.

So here the special tax paid as requierd by Section fourteen of chapter 150 would authorize a person to do any or all of the three things mentioned in the section. If he does any one of them he is guilty, unless he has paid the special tax required. If the proof is that he did one or all of the things specified, if he can show that he has paid the special tax, and has complied with the requirements of the statute, he is protected. The count charging the defendant with doing all the three things is proper, and the count is good. It is the better way to make the charge; and then if the proof is he did either, the indictment is sustained. Does the evidence justify the finding of the jury? From the evidence, it appears that the defendant, on the 17th day of October, 1887, in Boone county, sold to one Whitt Allen a bottle of medicine known as "Ragland's Lightning Relief," for which Allen paid him fifty cents, that the defendant declared in a public address at the time of offering the said medicine for sale, that he did not come for the purpose of practicing medicine nor treating diseases, but represented the medicine to be his own preparation, good for and would cure certain diseases, if taken according to directions; among which was neuralgia, and that the medicine was patented.

The bottle sold, with the wrapper, label and printed matter accompanying it was all given in evidence by the State, to which evidence the defendant objected, but the objection was overruled, and he excepted.

In this evidence the medicine was highly recommended to cure certain diseases. Then it appears from the said printed matter with the bottle, that "the public are most respectfully referred to the following certificates from gentlemen well known in this city, who testify from actual experience to the efficacy of this most excellent and reliable preparation. Sold by all druggists and medicine dealers. Price fifty cents per bottle. Liberal discount to the trade. Prepared exclusively by Dr. J. B. Ragland, Louisville, Ky." Then follows a number of testimonials from persons in Mississippi, Tennessee, and Kentucky, telling of the wonderful cures effected by the medicine. The defendant, to maintain the issue on his part proved that he was not an itinerant physician, practicing or attempting to practice medicine in this State; that on the occasion of the bottle of medicine before mentioned, he publicly and distinctly announced that he was not pretending to

Digitized by Google

treat or cure diseases, nor in any many to practice medicine, but simply to introduce and sell his medicine, the same being his own preparation and being patent or proprietary medicine under the laws of the United States, and that he had on the occasion of such sale as well as all other occasion in offering the same for sale, annouced that he would not treat diseases in any manner whatever, and that the virtue of the remedy was in the medicine itself, and not in him, the defendant, that any one else could sell such medicines as well as he himself could. The court who tried the issue in the place of the jury found the defendant guilty and assessed a fine against him of $100. The court overruled the motion for a new trial and in arrest of judgment, and entered judgment for the fine and costs. The evidence of the printed matter on the bottle when sold was proper.

From all the evidence the jury was certainly justified in finding the defendant an itinerant vendor of a drug. The finding was justified by the evidence, and the motion for a new trial was properly overruled. The indictment being good the motion in arrest of judgment was properly overruled.

There is no error in the judgment and it is affirmed,

Green, Snyder and Woods, J. J., concurred.

Digitized by Google

REPORT OF VISIT OF INSPECTION

OF

WHEELING'S WATER SUPPLY,

It was reported to the State Board of Health at its late meeting in Charleston that the sickness and mortality of Wheeling from typhoid fever was inordinately great. The State Board therefore passed the following resolution:

Resolved, That the secretary be directed to visit the city of Wheeling, and examine into the causes of such excessive prevalance of typhoid fever, and to make such suggestions to the municipal authorities as the circumstances of the case may seem to demand. The fifth section of the health law says: "The Board shall take cognizance of the interests of the life and health of the inhabitants of the State, and make or cause to be made sanitary investigations and inquiries respecting the causes of diseases, especially of endemics, epidemics and the means of prevention, the sources of mortality, the effects of localities, employments, habits and circumstances of life on the public health, &c." I therefore visited Wheeling on the 11th of August, 1887, and made such examination as the time and opportunities afforded. The main point being as to the possible and probable cause of the excessive mortality from typhoid fever as shown by the books of the Health Officer of the city. It is reported that the mortality from this cause has been very great for a number of years past and is progressively increasing from year to year. Now the source of contagion of typhoid fever is generally conceded to be the water

Digitized by Google

supply. My attention was therefore directed first to the probable sources of contamination of Wheeling's water supply. I found several sources which would make such contamination probable. First. The point of intake of the water is far down in the city, at the point selected many years ago, when the city was much smaller than at present, there being now a population of some several thousand people residing above that point, all of whose sewage empties into the river above point of intake (jumping station) in this part of the city are to be found the hospital, several factories, many stables and cow sheds, also the old cemetery, with its possible drainage through Jonathans Run. The drainage from the town of Martin's Ferry across the river is deflected to this side, also at low water by the dam placed across the river between the island and the Ohio shore. All these causes would make contamination of the water more than probable.

The analysis made in 1884 by Dr. Charles Smart, of the Surgeon General's office, Washington, D. C., establishes the fact of such contamination. And later analysis show still further contamination. Dr. Reeves, in his report as Secretary of the State Board of Health, dated January 1, 1885, says: "At Wheeling, the chief city of West Virginia, the water supply is unfit for the public use, for it is within the truth to state that, including the population of Martin's Ferry, the refuse from the homes of 10,000 people finds entrance into the Ohio river immediately above that of supply to the water works. If filth from hundreds of households, manufacturing establishments, privy-vaults, and other cesspools, horse and cow sheds, and the stinking bodies of dead animals, were all the sources of pollution of the water supply of Wheeling, its citizens might congratulate themselves that at least they were not worse off than some of the neighboring cities, but in addition to the sources of pollution just mentioned, an old dilapidated cemetery, Mt. Wood, occupying the hill at the northern part of the city, and within half a mile above the water works, is a highly probable factor of contamination." There is no evidence that there has been any material improvement in the condition of things since this report was made, but that the condition is as bad now as it was at that time.

Dr. Smart, in the analysis above referred to, says: "It (the analysis) a sewage inflow into the stream. * * Sewage is decomposed by the influences acting in running water and leaves only its skeleton in the form of the inorganic chlorides. * * but whether decomposed or undecomposed, sewage contamination is dangerous, not in itself, for waters polluted with sewage have been used for ages with impunity, but in that it may be accompanied by, and be the means of spreading the infection of typhoid fever and cholera. * * The germ, or poison of typhoid fever, may or may not be present in sewage. If it be not present the sewage is harmless as far as concerns the propagation of the disease; if it be present the water will convey the infection of typhoid fever whether the sewage be decomposed or not. In fact,

Digitized by Google

there is no evidence that the agencies which destroy ordinary organism or sewage matter in its course down stream have the slightest influence in destroying or removing the cause of this fever. On the contrary all the evidence accumulated of late years shows the pereistum of the germ or poison after the destruction of the sewage material which originally accompanied it. * * The detection of sewage in water by chemical means is therefore of no moment. The point of interest is the contamination of the water supply. If this is proven the water is dangerous and is undoubtedly the cause of much preventable sickness."

That the water supply of Wheeling is contaminated I think may be taken for granted. The next question is how it is to be corrected. It should be prevented or remedied, but how several ways suggest themselves. 1st and best. Carry the point of intake above the point of contamination. This is the most natural and proper way to meet the difficulty. The cost of this plan is urged as an objection. Can that be weighed in the balance as against the health and lives yearly sacrificed to this Moloch, and once done there is an end of the cost. 2d. To put in an intercepting sewer; this will only meet the difficulty in part, for part of the contamination comes from the other side of the river. 3d. To attempt to purify the water by some system of filtration. If this could be done it would involve a never-ending expense, and its result at best would be doubtful, for yet it has not been shown that any system of filtration is practicable on a large scale, and which will remove the germs of disease and make an unhealthy water healthy, though by removing matters held in suspension the appearance, taste and smell may be much improved.

Turning from impure and unhealthy water, I wish to say a word as to the condition of the air, especially as found along Wheeling creek, the effluvia from the various sources along this stream are not healthy and if not productive of typhoid fever, are capable of producing this disease, or by pressing the vital powers will lessen the ability to resist attacks. It has appeared for some time past as though the water and the air of the earth was to be so contaminated by the waste and the offal of the inhabitants thereof that it would soon cease to be habitable. I must congratulate Wheeling for the solution of this vexed question, "What to do with garbage," I think the crematory solves the question, its work is perfect, though its present methods of handling the material are crude and imperfect. I would also suggest the method pursued in Glascow, Scotland, where the refuse is divided into the manurial and non manurial constituants. The former being put into a mixing machine, from which it comes in the form of a deodorized compound to be sold for agricultural purposes, whilst the latter is passed into the furnace and consumed.

In accordance with the resolution above quoted, it has seemed proper to make these suggestions which are respectfully submitted for your consideration, in the hope that your action in the matter may relieve your city from a large amount of sickness

Digitized by Google

and mortality from a preventable disease; whose source if not in filth, is thereby preserved and propogated.

Very respectfully,

T. A. HARRIS,
Secretary State Board of Health.

GENTLEMEN:—The pumping station for the water works of Whee'ing occupies to-day the sight selected for it over half a century ago. The basin from which water is supplied for domestic and palatable purposes is situated upon the hillside, at the head of Eighth street, and at an elevation which gives from sixty-five to seventy pounds pressure to the square inch in the lower lying portions of the city, the pressure varying elsewhere from that to nothing. Possibly there are three hundred houses within the corporate limits of the city which are not supplied with water from the city mains. The Water Board has under process of construction a high service basin, which when completed will have a storage capacity of two and a half to three million gallons. The present basin has a capacity of seven hundred and seventy thousand gallons. The new basin will increase the pressure twenty-five or thirty pounds. The pipes through which the water is distributed are, for the most part, old and of inferior quality. The average consumption of water is about three million gallons per diem. It is not with the water works, however, that this article has to deal, but with the quality of the water dispensed through them, and some of the methods of water sanitation practiced in other cities.

The city of Wheeling has increased in population with the growth of years, until now it extends along the river one and a half miles above the pumping station, and the sewage of 250 acres of a densely populated portion of the city is drained into the river just above the intake of the water works.

It is well known that river waters are very variable in their constitution. They probably reach their maximum impurity during the periods of autumnal rain falls, and snow melting in spring, when the streams are swollen and turbid with the various kinds of filth washed from the surface of their drainage area. Ordinarily the converse is true when the water level is low, and the current fed less by surface shed rain showers than tributary springs.

But when, as is the case with the river from which the water supply of the city of Wheeling is obtained, the current is being constantly fed by sewers, the water is then more impure than at any other time. The city sewers are not the only sources of contamination. There are four or five large factories from which all impurities are drained directly or indirectly into the river. A large laundry, situated at the corner of Main and Fifth streets, less than three squares above the pumping station, discharge daily the washings from much of the dirty linen in the city into

Digitized by Google

the river, which fact of itsef, would be sufficient cause to condemn the water as unfit for potable purposes. Then there is the Wheeling Hospital and Orphan Asylum, situated on the river bank between Second and Third streets, from which drain pipes discharge directly into the river all waste and effete matter from those institutions. Mt. Wood Cemetery, situated on the hill, seamed by coal entries long since abandoned, may or may not add to the already overwhelming contamination and pollution of the river water. Last, but not least, Martin's Ferry, a city of seven or eight thousand inhabitants, situated upon the Ohio side, one mile above Wheeling Water Works, last year erected water works, and has already begun the construction of sewers which will, when completed, discharge additional filth into the now over charged stream to the further detriment to the health of our citizens, who are obliged to drink the water thereof.

It does seem almost incredible that a community like the city of Wheeling, which sustains four daily newspapers, and enjoys such a high standard of intelligence as to maintan a public library, should patiently tolorate a nuisance, such as emptying into the source of its water supply, the filthy, stinking, semi-liquid emanations of all the sewers, from an area of at least one-tenth of its population.

Although attention has been called to the various sources of pollution of the drinking water, through the public press and otherwise, time and time again, with all the fullness of an infinite disgust, and in terms which are still tolerably satisfactory to the most zealous opponents of public nastiness, and much has been done thereby to awaken the people to a sense of their danger, there are yet many doubting Thomases' who are either innocently, ignorantly, or by the force of careless habits, guilty of acquiescing to the fate of hundreds of their fellow creatures who die from filth diseases.

What are the duties of the State Board of Health in such a case? It is of the highest importance in the interest of the life and health of the people of any community, that they have a pure, wholesome and abundant water supply. The filthy condition of Wheeling's water supply is no longer a question.

Three remedies present themselves.

First.—Prevent the sewage from being discharged into the river.

Second.—Remove the water works to a point above sewage contamination; or

Third.—Filtration.

The first is impracticable, for while the sewage of North Wheeling might be carried safely past the intake of the water works, by means of intercepting sewers, that of Martin's Ferry would still contaminate.

It is not probable that the city of Wheeling will remove the works up the river for many years to come, on account of the vast sums which have been applied to the improvement of the

Digitized by Google

present plant during the past six or eight years. The improvements being made now, have been estimated by the Water Board to cost in the neighborhood of $50,000.

We now come to the third remedy, purification by filtration.

Filters, in which certain chemical and mechanical features are involved, have been in use for household, laboratory, and manufacturing purposes for many years. A careful examination into these features is sufficient to convince us that the practical solution of the water problem lies in this direction.

Among the many plans devised for the mechanical separation of water from organic matters held in solution, and inorganic matters held in suspension, the most primitive is that in use at London, England, to-day, where vast basins are filled with layers of stone, gravel and sand, through which the water percolates from the top, to galleries at the bottom, and flows off to distributing basins.

This process requires the placing of entirely new filtering material at stated intervals—as it soon becomes thoroughly permeated with the filth that is in the water.

Although the people of the Old World are slow to change their methods Mr. Bishop, about twenty years ago, advocated "settling-basin filtration" of water by the chemical action of iron upon its organic and other soluble contents. Prof. Bischof's filter bed consisted of a top layer of sand, an intermediate mixture of granular iron and gravel, and a bottom layer of sand. The water issued at the rate of only seventy-five gallons in twenty-four hours, per square foot of filtering surface. The upper layer had to be scraped off and replaced with clean sand about every two weeks. The Bischof system was in operation at Antwerp on a large scale for some time, cleaning the water almost perfectly, but owing to the greatly polluted condition of the river, the iron had an abnormal amount of work to do, and the layer of gravel and iron was quickly choked by the dissolved impurities.

When the top layer was removed the gravel and iron particles were found thickly coated with a redish, slimy substances to the depth of six or eight inches, while deeper down the mixture was of an intense black.

Next came the Birchof-Anderson system, which was an attempted improvement to hasten filteration and prevent clogging of the iron part of the filter bed. The mechanism by which Mr. Anderson sought to accomplish this consisted of a horizontal revolving cylinder filled with iron filings through which the water should pass, and issue into the filter bed of sand with its soluable impurities disengaged and coagulated for filtration.

This treatment is said to remove much of the infusorial life, to reduce the amount of albuminoid ammonia in very foul waters, one-fifth to one-half; produce precipitation of the carbonates, and likewise secures an appreciable amount of softening.

It remained, however, for America to achieve the crowning triumph of success in water sanitation, through the late Isaiah

Digitized by Google

Smith Hyatt, of New Jersey. Mr. Hyatt's system has been perfected by John W. Hyatt, of New York, his son, and has for its object the clarifying and purifying of water by first coagulating the impurities and afterwards filtering it, two distinct principles. It is well known that the purification of water, by filtration only, has proved to be impracticable on a large scale, because it is impossible for any filter operating upon large volumnes of water to retain the fine silt held in suspension, and the organic matters held in solution. To over come this difficulty, Mr. Hyatt's invention is directed. The apparatus consists of tanks filled with gravel, sand and coke, with inlet and outlet pipes for the water, and air inlet value arranged to permit air to pass automatically to the inflowing water; and also an apparatus for automatically charging the water with the chemical reagent, or coagulant.

Provision is made for thoroughly washing and cleansing the filter bed as often as necessary, so that bright, clear water of standard purity is guaranteed by its use. For further informa tion upon this system of water purification see

49th Congress, 1st Session } Senate. { Extra Document, No. 154.

In which will be found reports relative to filters for the water supply for the Capitol; also, report of the committee on Science and the Arts, to whom was referred the investigation of the Hyatt Pure Water System, recommending that the John Scott Legacy Premium and Medal be awarded to Isaiah Smith Hyatt, for that important invention, which report will be found in the Journal of the Franklin Institute of Philadelphia, for July.

G. I. GARRISON, M. D.

Digitized by Google

REPORT OF INSPECTION OF THE PENITENTIARY.

By the direction of the State Board of Health, I visited the Penitentiary at Moundsville on the 19th of August, 1887, for the purpose of inspecting its sanitary condition. I found the central portion of the building devoted to the use of the Warden, the guards and the general officers, in rather a dilapidated condition, out of repair generally. The furniture and carpets old worn and needing repair and renewal. There is a decided want of paint and white wash, the water closets and bath rooms out of repair, needing cleaning and cement, the sewer pipes are not in good condition as there is evidence of leakage, the traps in use are of old patterns and do not preclude the possibility of leakage, evidence of which is to be found in the presence of bad odors in this part of the building which has no direct connection with the prison. The water supply in the attic is inadequate, should there be at any time need for extinguishing fire. Under such circumstances the position of the warden's family in the top story with only one long stair-case as a means of exit would be, to say the least, very precarious. The stand pipe into which the different sewer pipes in this building empty, though it extends to the roof, does not afford the draught necessary to carry off the different gasses admitted to it by the sewer pipes emptying into it. A current in it should be established by arranging for the constant discharge of spent steam through it by means of a pipe from the eugine house, which pipe should enter at the bottom of the stand pipe and should be constantly maintained. This I think would remove the bad odor about this part of the building. The prison was clean and in good order. The ventilation of the prison could be made good by the proper use of the windows, but there should be placed screens at both top and bottom of the windows, which whould deflect the current of air admitted to the floor. The ventilators placed on the top of the prison roof should be collected into one or more stand pipes, which should be carried up as high, at least, as the roof of the main building for the constant escape

Digitized by Google

of gasses arising therefrom, as at present arranged, they will inevitably be wafted by the prevailing winds of summer into the windows in the upper stories of the main building to the detriment of the health of its occupants. The work shops and grounds are generally in fair sanitary condition, but I think some improvement could be made in cleaning and deodorizing the water closets and urinals both in the shops and on the outside of the main building, also in the cementing the openings into the drains and sewers outside (1) (2) (3).

In conclusion, I would report what I have said as to teh need of general repair of the central portion of the building, and the need of a steam escape into the general sewer pipe, also the need of collecting into one or more stand pipes the gasses coming out of the ventilators on the top of the prison, which pipes should extend above the level of the windows in the central building.

The dining room and kitchen were found to be in very good sanitary condition.

The increased elevation of temperature as found in the upper cells as compared with the lower, should he be relieved by free exif for the air heated and contaminated in the lower portion. It is well to remember that all foul gasses are not light but many of them are heavy, and will rise only when heated or exposed to a draught.

The general sewage of the premises is good, and is delivered into Grave Creek, which empties into the Ohio River some distance below the point of intake of water for the institution. The water used is obtained from the Ohio River and is as good as the average water of that stream. There is a well on the premises from which some water for drinking purposes is obtained, but there is no reason to suppose that this water is inferior to the average well water of this section.

The Hospital was found in satisfactory condition.

Very respectfully,

T. A. HARRIS,

Secretary State Board of Health.

Digitized by Google

REPORT OF VISIT OF INSPECTION TO THE INSANE ASYLUM.

By direction of the Board, I visited the Insane Asylum, at Weston, October 6th, 1887, with a view to the inspection of its general sanitary condition, but more especially to investigate a nuisance complained of in the discharge of its sewage into the river, and to suggest some remedy for the said nuisance, which is much complained of by the citizens of Weston and the vicinity.

I found the general sanitation of the Asylum good, and desire to express my hearty approval of the improvement made in substituting turned brick arches and well cemented floors for water closets in place of the old wooden floors which were always in bad condition. Soiled to saturation with the fluid and solid excreta of the inmates to the detriment and discomfort of the patients.

The ventilation is as good as possible under the circumstances. The arrangement for heating the wards and halls is very good except that in the intake of cold air in the basement to be warmed and sent into the wards and halls. The foul air of the building, which has been already used, is allowed access to the heaters, thus using in part the same air over and over again. Air from the wards and halls is allowed, through dust holes and other openings, to descend into the basement, from whence the supply of air for the heaters is obtained. Fresh, pure air from outside of the building alone should be used. A move in the right direction was the use of a wooden conduit from the outside for introducing pure air, but it was not sufficiently tight to exclude the air of the basement. The sewage of the Hospital is excellent. All the refuse and excreta being carried away from the building in a very satisfactory manner. The point of delivery into the river is twenty two feet below the lowest point of the drainage within the building, but the emptying into the river of sewage and excreta from an institution containing nearly a thousand persons, must of

Digitized by Google

necessity contaminate the stream, especially when the water is low. I cannot see that any change in the place of sewage and drainage can be made for the benefit of the institution. But the citizens of Weston and vicinity are to be considered, and if possible some way devised for giving them relief. The place I would suggest for correcting the evil, in part at least, would be to build a settling tank between the Asylum and the river, for the purpose of separating the solid from the fluid excreta. It should be built of brick lined with cement, the top securely covered into this, on one side the sewage from the institution should flow, and from the other side only the liquid parts pass on to the river. Disenfectants and deodorizers should be freely used. When the tank is nearly full it might be turned into the river at high water.

Respectfully submitted,

T. A. HARRIS,
Secretary.

Digitized by Google

VITAL AND MORTUARY STATISTICS.

FOR THE YEAR ENDING, JUNE 30, 1888.

Sections of the Health law, Acts of 1887, relating to the collection of Vital and Mortuary Statistics.

SEC. 23. The State Board of Health shall have supervision of the State system of registration of marriages, births and deaths, as hereinafter provided; they shall make up such forms, and recommend such legislation as shall be deemed necessary for the thorough registration of Vital and Mortuary Statistics throughout the State. The Secretary of the Board shall be registrar of Vital Statistics, and he shall make and publish a report of the vital statistics of the State along with his report as Secretary of Board of Health; and for his services as registrar he shall be paid a salary not to exceed five hundred dollars, to be fixed by the Board of Health and to be paid out of the fund provided for the Board of Health.

24. It shall be the duty of all physicians and accoucheurs in this State to register their names and postoffice address with clerk of the county wherein they reside; and said physicians, accoucheurs and accoucheure, shall be required, under a penalty of ten dollars, to be recovered in any court of competent jurisdiction in the State, at the suit of the county clerk to report to the clerk of the county court, within thirty days from the occurrence, all births and deaths which may come under their supervision, with a certificate of the cause of death and such co-relative facts as the Boards may require in the blank forms to be furnished as hereinafter provided; and they shall receive

Digitized by Google

from the county the sum of twenty-five cents for every such report made to the clerk of the county court.

25. When any birth or death shall take place, no physician or accoucheur being present, the same shall be reported to the clerk of the county court within thirty days thereafter, with the supposed cause of death, by the parent, or if none, by the nearest of kin, not a minor, or if none, by the resident house-holder where the birth or death occurred, under the penalty and provisions of Section 24 of this act.

26. Coroners and undertakers of the several counties shall be required to report to the clerks of their county courts all cases of death which may come under their supervision, with the cause and mode of death, etc., as per forms furnished, under the penalty as provided in Section 24 of this act.

27. All ministers of the gospel shall report to the clerk of their county courts all marriages celebrated by them, under the penalty as provided in Section 24 of this act.

28. The county court clerks of all the counties in this State shall be required to keep separate books for the registration of the names and postoffice address of physicians and accoucheurs, for marriages, births and deaths; said book shall always be open to inspection without fee; and said county clerks shall be required to render a full and complete report of all marriages, births and deaths to the Registrar of Vital Statistics, annually, on the first day of July, and oftener if required; and for his services the clerk of the county court shall receive, from the revenues of the county, two cents for each name reported by him, on a penalty of one hundred dollars for failing to do so.

29. It shall be the duty of the State Board of Health to prepare such forms for the record of the marriages, births and deaths, as they may deem proper; the said forms to be furnished by the Secretary of said board to the clerks of the county courts, whose duty it shall be to furnish them to such persons as are herein required to make reports.

CAUSES OF DEATH.

In our arrangement of the causes of death, we have placed:

First—*Specific, febrile*, or *zymotic diseases*, embracing the miasmatic diseases, small-pox, varioloid, chicken-pox, measles, scarlet fever, typhus fever, influenza, mumps, diptheria, cerebro spinal fever, whooping cough, continued fever, enteric fever, yellow fever, and other miasmatic diseases; *diarrhetic diseases*, cholera infaum, cholera morbus, winter cholera, diarrhœa and dysentery; *malarial diseases*, intermittent fever, remittent fever, congestive fever, and other malarial diseases; *zoogenous diseases*, hydrophobia, etc.; *venereal diseases*, syphilis, etc.; and *siptic diseases*, phagedeuer, erysipelas, pyemia, septicemia, and puerperal fever.

Second—*Parasitic Diseases*—Thrush, hydalids, worms, trichiniosis, etc.

Digitized by Google

Third—*Dietic Diseases*—Starvation, scurvy, alcoholism, delirium tremens.

Fourth—*Constitutional Diseases*—Rheumatic fever, rheumatic heart, rheumatism, gout, rickets, cancer, tabes mesenterics, tubercular meningitis, phthisis, scrofula, purpura, anemia, diabetes mellitus, etc.

Fifth—*Developmental Diseases*—Premature birth, atelectasis, cyanosis, spina bifida, umbilical hemorrhage, &c.

Sixth—*Local Diseases*—First, of the *Nervous System*—Inflamation of the brain, apoplexy, softening of brain, hydrocephalous chronic, hemipligia, paralysis agitans, parapiyia, epilepsy, trismus nascintium, tetanus, diseases of spinal cord, &c. *Circulatory System*—Endocerditis, pericorditis, hypertrophy of heart, angina pectoris, valvular disease of heart, syncope, aneurism, senil gangrene, embolism, phlibitis, &c. *Respiratory System*—Laryngitis, croup, embyzema, asthma, bronchitis, pneumonia, pleurisy, &c. *Digestive System*—Stomatitis, sore throat, dyspepsia, hematemis, melana, enteritis, ilus, stricture and strangulation of intestines, intussusception hernia, peritonitis, accites, cirrhosis, &c. *Urinary System*—Nephritis, Bright's disease, uremic, &c. *Reproductive Organs*—Ovarian disease, diseases of uterus and vagina, pelvic abcesss, perineal abcess, parturition, abortion, puerperal convulsions, placenta pravic, flooding, &c.

Seventh—Violence, railroad accident, other accidents, homocide, &c.

Eighth—*Unclassified*—Dropsy, debility, tumor, abscess, sun stroke, hemorrhage, &c.

The total number of deaths from all causes for the year ending July 1st, 1888, is 2,312, representing returns from thirty-five counties. Nineteen clerks of county courts have failed to make reports of births and deaths, as required by law. Of the thirty-five reports nearly all are satisfactory, showing on the part of physicians and clerks a commendable effort to carry out the law.

All things considered, we should feel encouraged at the success of our first year's work in the collection of vital statistics.

Of the 2,312 deaths 1,162 were males, 1,137 were females, and in thirteen the sex was not stated. Under the head of miasmatic diseases, we have 267 deaths, or a little over eleven per cent. Typhoid fever stands at the head of this list; eighty cases, or three and a half per cent. Measles, fifty four cases; a little less than two per cent.

Diarrhetic diseases was the cause of death in 153 cases; not quite six per cent. The mortality from these diseases was principally among children, 120 deaths occurring in children under five years. Constitutional diseases are accredited with 388 deaths, or nearly sixteen per cent, phthisis alone causing 274 deaths, or more than eleven per cent. Disease of the nervous system is reported as the cause of death in 232 cases, or ten per cent.

Diseases of the respiratory system stands second in importance

Digitized by Google

in point of numbers, 336 deaths, or fourteen and a half per cent. Of these more than one-half, 193, or eight per cent, was caused by pneumonia. The deaths from diseases of the digestive system was 132, or about five per cent.

For the year covered by this report the sum total of mortality from the zymotic diseases, cerebro-spinal fever, typhus fever, enteric fever, malarial diseases, scarlet fever, measles, erysipelas, whooping cough, diptheria and diarrhœal diseases, which are of special concern to the health authorities, was 330, or 14.25 per cent.

Of the 2,312 deaths reported, 421 occurred within the first year; 710, or thirty per cent., before the age of five years. Twelve deaths are reported in persons over ninety years.

Digitized by Google

TABLE A.

Number of deaths for each month by counties.

COUNTIES.	January	February	March	April	May	June	July	August	September	October	November	December	Total
Barbour	6	3	3	2	.....	3	1	3	2	2	1	3	29
Berkeley	19	23	18	14	12	4	6	7	16	11	16	16	162
Boone	2	6	1	4	...	2	6	5	.....	2	1	.....	29
Braxton	3	4	4	4	4	1	.....	.....	.....	.....	1	4	27
Cabell	11	6	12	5	5	11	4	8	5	14	6	11	98
Calhoun	.....	4	5	4	3	1	3	1	6	5	.....	1	33
Dodridge	.....	9	8	7	7	4	5	6	7	6	4	4	67
Fayette	4	7	7	9	11	13	14	7	4	.....	.....	.....	76
Gilmer	5	2	5	6	6	1	.....	.....	6	.....	1	1	33
Greenbrier	19	17	26	16	24	5	2	3	6	7	10	10	145
Hampshire	1	.....	.....	1	.....	1	.....	2	3	.....	.....	5	13
Hancock	3	5	8	3	5	8	7	7	3	2	.....	4	55
Hardy	5	3	5	9	2	4	.....	1	.....	.....	2	3	34
Harrison	14	5	6	8	10	10	10	8	3	6	7	9	96
Jefferson	12	18	13	14	6	8	10	11	5	4	5	7	113
Kanawha	18	10	7	9	5	9	2	1	4	9	8	6	88
Lewis	16	9	12	5	10	4	7	2	6	9	5	10	95
Lincoln	.....	.....	.....	1	1	.....	1	.....	3	2	.....	.....	8
Marion	9	3	3	6	5	3	4	7	11	3	4	5	63
Mason	9	5	9	9	4	5	3	6	8	15	5	7	85
Mercer	1	4	7	6	14	13	.....	1	2	2	.....	2	52
Mineral	7	5	6	4	.....	7	6	11	16	11	5	3	81
Monongalia	7	7	9	6	3	3	1	....	5	4	5	12	62
Ohio	31	48	29	26	17	46	34	29	23	37	29	30	379
Pleasants	1	.....	1	1	1	2	1	1	2	3	3	1	17
Raliegh	.....	.....	.....	.....	.....	1	8	2	.....	.....	.....	.....	11
Richie	6	10	1	7	7	.....	1	.....	.....	1	5	6	44
Taylor	6	4	4	2	5	6	6	6	8	11	3	5	66
Tucker	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Tyler	8	11	9	8	5	4	6	6	4	7	5	8	81
Upshur	.. .	.....	.....	.....	.....	.....	2	2	5	2	2	1	14
Wayne	1	.....	1	....	1	.....	.....	.....	.....	1	.....	.....	4
Witzel	17	7	6	6	2	2	4	3	2	5	8	5	67
Wirt	1	.....	3	4	.....	.....	.....	.....	.....	1	.....	...	9
Wood	14	13	12	5	4	7	9	5	5	6	2	11	93
Total	257	247	240	212	179	188	163	151	170	188	143	190	2312

Digitized by Google

TABLE B.

CAUSES OF DEATH.	SEX.			COLOR.			NATIVITY.				SOCIAL CONDIT'N					Total.....
	Male.....	Female...	Not stated	White.....	Colored...	Not stated	West Va...	U. States...	Foreign.....	Not stated	Single.....	Married...	Widower..	Widow.....	Not stated	
I.—Specific, Febrile or Zymotic Diseases.																
A.—Miasmetic Dis's.																
1 Small-pox	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 Varioloid	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3 Chicken-pox	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4 Measles	21	33	.....	47	7	.....	48	6	.....	.....	45	6	.....	.....	3	54
5 Scarlet fever	1	3	.....	4	.....	.....	4	.....	.....	.....	4	.....	.....	.....	.....	4
6 Typhus fever	16	14	.....	27	2	1	16	11	.....	3	18	7	.....	1	4	30
7 Influenza	.....	1	.....	1	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	1
8 Mump	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9 Diphtheria	26	20	.....	45	1	.....	36	10	.....	.....	40	1	.....	.....	5	46
10 Cerebro-spinal fe'r..	9	11	.....	20	.....	.....	13	6	.....	1	20	.....	.....	.....	.....	20
11 Whooping-cough	5	10	.....	13	2	.....	13	2	.....	.....	15	.....	.....	.....	.....	15
12 Continued fever	.....	3	.....	2	1	.....	3	.....	.....	.....	2	.....	.....	1	.....	3
13 Enteric fever	44	36	.....	76	4	.....	62	12	2	4	49	30	.....	1	.....	80
14 Yellow fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15 Oth'r miasmatic dis	10	4	.....	14	.....	.....	12	1	1	.....	5	9	.....	.....	.....	14
B.—Diarrhetis Diseas's.																
16 Cholera Infantum	43	40	.....	78	4	1	67	9	4	3	83	.....	.....	.....	.....	83
17 Cholera morbus	3	2	.....	5	.....	.....	2	2	.....	1	2	1	.....	.....	2	5
18 Winter cholera	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
19 Diarrhœa	12	12	1	21	4	.....	14	6	3	2	13	6	.....	2	4	25
20 Dysentery	19	21	.....	36	2	2	29	10	.....	1	28	7	1	2	2	40
C.—Malarial Diseases.																
21 Intermittent fever	2	.....	.....	2	.....	.....	1	1	.....	.....	2	.....	.....	.....	.....	2
22 Remittent fever	5	5	.....	10	.....	.....	7	1	2	.....	5	5	.....	.....	.....	10
23 Congestive fever	1	.....	.....	1	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	1
24 Other malarial dis	7	4	.....	10	1	.....	6	5	.....	.....	6	2	1	.....	2	11
D.—Zoogenous Diseas's.																
25 Hydrophobia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26 Other zoogenous dis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
E.—Venereal Diseases.																
27 Syphilis	.....	3	.....	2	1	.....	3	.....	.....	.....	2	1	.....	.....	.....	3
28 Oth'r venereal dis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
F.—Septic Diseases.																
29 Phagedena	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30 Erysipelas	9	4	1	12	1	1	12	1	1	.....	6	3	1	1	3	14
31 Pyemia	2	1	.....	3	.....	.....	2	1	.....	.....	1	2	.....	.....	.....	3
32 Septicemia	2	4	.....	5	1	.....	5	1	.....	.....	1	3	.....	.....	2	6
33 Puerperal fever	.....	9	.....	9	.....	.....	5	4	.....	.....	1	7	.....	.....	1	9
II.—Parasitic Diseases.																
34 Thrush	.....	1	.....	1	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	1
35 Hydatids	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
36 Worms	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37 Trichiniosis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38 Other parasitic dis	1	3	.....	4	.....	.....	4	.....	.....	.....	4	.....	.....	.....	.....	4
III.—Dietic Diseases.																
39 Starvation	1	1	.....	.....	1	1	2	.....	.....	.....	2	.....	.....	.....	.....	2
40 Scurvy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
41 Alcoholism	4	1	.....	5	.....	.....	1	1	.....	3	1	3	1	.....	.....	5
46 Delirium tremens	1	.....	.....	1	.....	.....	1	.....	.....	1	.....	1	.....	.....	.....	1
Totals this sheet	244	246	2	454	32	6	369	91	16	16	358	94	4	8	28	492

Digitized by Google

TABLE B—*Continued.*

CAUSES OF DEATH	SEX.			COLOR.			NATIVITY.				SOCIAL CONDI'ON					TOTAL
	Male	Female	Not stated	White	Colored	Not stated	W. Va.	U. States	Foreign	Not stated	Single	Married	Widower	Widow	Not stated	
IV—*Const t'al Diseases.*																
43 Rheumatic fever		2		2			1		1		1	1				2
44 Rheumatic heart	1	3		4			3		1		1	3				4
45 Rheumatism	6	4		10			8	2			1	7	1	1		10
46 Gout																
47 Rickets																
48 Cancer	6	9		13	2		9	6			2	9	1	3		15
49 Tabes mesenterica	3	2		5			5				5					5
50 Tuber'r meningitis	18	10		26	1	1	24	4			22	4		1	1	28
51 Phthisis	119	152	3	233	37	4	180	66	11	17	112	133	10	14	5	274
52 Scrofula	8	9		12	5		14	3			14	2			1	17
53 Purpura		1		1			1				1					1
54 Anemia		1		1			1					1				1
55 Diabetes mellitus	4	1		4	1		2	3			2	3				5
56 Other consti'al dis	10	16		24	1	1	8	13	3	2	6	12	1	1	6	26
V—*Develop'al Diseas's*																
57 Premature birth	11	11		20	2		19	3			22					22
58 Atelectasis		2		2			2				2					2
59 Cyanosis	12	2		11		3	8	2		4	12				2	14
60 Spina bifida	1	1		1	1		1			1	2					2
61 Other congen'l d'fts	2	5		7			2	5			7					7
62 Umbilical hem'age		3		2	1		3				3					3
63 Old age	24	26		42	8		12	28	8	2	5	14	13	14	4	50
VI—*Local Diseases*																
A—*Nervous System.*																
64 Inflam'on of brain	19	25	1	40	5		27	18			33	7		3	2	45
65 Apoplexy	17	13		28	2		11	12	5	2	4	15	5	5	1	30
66 Softening of brain	8	2		10			8		2		3	5	1		1	10
67 Hydrocep's, not ac	1	4		4		1	5				5					5
68 Hemiplegia	3	5		7	1		4	4			1	5		1	1	8
69 Paralysis agitans	7	4		11			3	6		2		5	1	3	2	11
70 Gen par'sis of insa'e	4	4		7	1		3	2		3	2	3			3	8
71 Paraplegia	4	3		7			4	3			1	3	1	2		7
72 Chorea		2		2			2				2					2
73 Epilepsy	7	4		11			5	5	1		7	3			1	11
74 Convulsions	16	16		29	3		27	3	1	1	29	1			2	32
75 Trismus nascent'm																
76 Tetanus																
77 Dis. of spinal cord	9	10		17	2		16	3			15	2		1	1	19
78 Other dis, nerv. sys	23	21		41	3		24	14	4	2	17	11	3	7	6	44
B—*Org. of Special Sense.*																
79 Epistaxis																
80 O'r dis., nose, ear, eye	3	3		3			3				2	1				3
C—*Circulatory System.*																
81 Endocarditis		2		2				1	1			2				2
82 Pericarditis	1			1					1			1				1
83 Hypert'phy of hea't	4	2		6			5	1			2	3			1	6
84 Angina pectoris	7	6		12		1	3	5	4	1	3	5	4	1		13
85 Val.-dis of heart	34	28		57	3	2	32	12	15	3	15	27	4	13	3	62
86 Syncope		3		2	1		2			1		3				3
87 Aneurism	1			1				1				1				1
Totals this sheet	393	414	4	718	80	13	487	225	58	41	361	292	45	70	43	811
	244	246	2	454	32	6	369	91	16	16	358	94	4	8	28	492
	637	660	6	1172	112	19	856	316	74	57	719	386	49	78	71	1303

Digitized by Google

TABLE B.—*Continued.*

CAUSES OF DEATH.	SEX.			COLOR.			NATIVITY.				SOCIAL CONDIT'N					Total
	Male	Female	Not stated	White	Colored	Not stated	West Va.	U. S.	Foreign	Not stated	Single	Married	Widower	Widow	Not stated	
88 Senile gangrene	3	4		7			4	2	1		2	3		1	1	7
89 Embolism		1		1			1				1					1
90 Phlebitis		2		2				1	1			1		1		2
91 Varicose veins																
92 Other dis cir. sys.	9	18		13		4	6	6	2	3	5	6	3	2	1	17
D.—Respiratory system.																
93 Laryngitis	1	3		4			4				4					4
94 Croup	19	14		32		1	28	4		1	33					33
95 Oth. dis. l'r'yx tr'c'a	1	2		2		1	2	1			2	1				3
96 Emphysema		1		1				1						1		1
97 Asthma	4	2		5	1		4	2				4		2		6
98 Bronchitis	19	24	1	36	7	1	30	9	4	1	27	11	2	1	3	44
99 Pneumonia	104	88	1	169	24		108	59	10	16	82	46	12	18	35	193
100 Typhoid pneum.	18	20		33	5		26	11		1	16	16		2	4	38
101 Pleurisy	1	2		3			3					3				3
102 Other dis. res. sys.	19	22		38	3		26	11	2	2	15	17	3	1	5	41
E.—Digestive system.																
103 Stomatitis	4			4			4				2	2				4
104 Dentition	1			1			1				1					1
105 Sore throat	2			2			2				2					2
106 Dyspepsia																
107 Hematemisis																
108 Melana																
109 Disease of stomach	7	18		23	2		16	8		1	7	9		7	2	25
110 Enteritis	8	8		16			11	2	2	1	10	4			2	16
111 Ulc. of intestines	5	4		9			5	3	1		5	4	1	1		9
112 Ileus		1		1			1					1				1
113 Strict. and strang. of intestines	1	5		6			2	1	2	1	2	2		2		6
114 Intussusception	2	3	1	6			5	1			3	1	1	2		6
115 Hernia	6			6			3	1	2		2	4	3			6
116 Fistula	1			1			1					1	1			1
117 Peritonitis	8	12		16	4		10	5	3	2	7	10	1	2		20
118 Ascites		1		1			1					1				1
119 Gallstones		1		1			1				1					1
120 Jaundice	3	8		8	3		7	4			9	1			1	11
121 Cirrhosis	3	1		4	5		3	1			2	1				4
122 Other dis. of liver	10	9	1	19	1		7	9	2	2	6	8	3	1	2	20
123 Other dis. dig. sys.	10	8		18			14	3	1		11	5	1	1		18
F.—Lymphatic system.																
124 Dis. of lymphatics	1			1					1			1				1
125 Diseases of spleen																
G—.Gland like organs of uncertain use.																
126 Bronchocle																
127 Addisons disease																
H.—Urinary disease.																
128 Nepritis	3	5		6	2		7		1		2	5	1			8
129 Bright's disease	14	18		25	6	1	17	12	2	1	7	17	4	4		32
130 Uremia	3	2		4	1		2	1		2	3	1		1		5
131 Suppres. of urine		1		1			1							1		1
132 Calculus	2			2			1	1			1	1				2
133 Hematuria		1		1						1				1		1
Totals this sheet	293	298	4	528	59	8	364	158	38	35	270	185	32	52	56	595
Totals sheets	637	660	6	1172	112	19	856	316	74	57	719	386	49	78	71	1303
Totals	930	958	10	1700	171	27	1220	474	121	92	989	571	81	130	126	1898

Digitized by Google

TABLE B.—*Continued.*

CAUSES OF DEATH.	SEX.			COLOR.			NATIVITY.				SOCIAL CONDIT'N					Total
	Male	Female	Not stated	White	Colored	Not stated	West Va.	U. S.	Foreign	Not stated	Single	Married	Widower	Widow	Not stated	
134 Dis. of blad. pros	2			2					1	1		2				2
135 Other dis. urin. sys	6	5		10		1	5	4	2		3	7	1			11
I—Reproductive organs																
A—Organs of Generat'n																
136 Ovarian diseases		4		4			3	1			1	2			1	4
137 Dis of ut. and vag		6		6			2	4			1	3		2		6
138 Disorders of mens		3		3			3				3					3
139 Pelvic abscess																
140 Perineal abscess																
141 Dis. testes, penis, &c	2			1	1		1	1				2				2
B—Parturition.																
142 Abortion																
143 Miscarriage		1			1			1			1					1
144 Puerperal mania		5		5			5					4				5
145 Puerp. convuls'ns		7		7			6	1			1	6				7
146 Placenta prævia																
147 Flooding		2		1	1		1	1				1		1		2
148 Phlegmatic dolens					2											
149 Oth. comp. ch'db'h		10		9			5	3		2		9			1	10
K—Locomotor system.																
150 Caries and necrosis	1				1		1				1					1
151 Arthritis	1			1			1				1					1
152 Ostitis																
153 Other dis, loco. sys	1			1			1				1					1
L—Integumentary sys.																
154 Carbuncle	2			2			1	1				2				2
155 Phlegonm																
156 Lupus																
157 Ulcer																
158 Eczema																
159 Pemphigus		1		1			1				1					1
160 Other dis., int. sys.	1			1			1				1					1
VII—Violence.																
161 Railroad accident	18			14	4		7	9	1	1	9	6	2		1	18
162 Other accidents	41	21		48	12	2	36	23	2	1	36	15	2	2	7	62
163 Homicide	3	1		3	1		2	1	1		3	1				4
164 Suicide	1	1		2					2			1		1		2
165 Execution																
VIII—Otherwise Unclassified.																
166 Dropsy	13	15		23	4	1	19	8		1	9	12	2	4	1	28
167 Debility	25	16		35	6		24	8	5	4	14	13	3	3	8	41
168 At'phy from ina'n		3		3			2	1			3					3
169 Mortification																
170 Tumor		1		1			1				1					1
171 Abscess	5	1		5	1		3	3			4	1	1			6
172 Hemorrhage	3	6		9			6	3			4	4	1			9
173 Sun-stroke	3			3			2		1		1	2				3
174 Sudden—not st'ted	2	2		4			1	3			1	2		1		4
175 Ill-defined	47	36	1	75	6	3	42	20	16	6	40	29	2	4	9	84
176 Unknown	55	32	2	77	10	2	49	29	8	3	44	24	4	8	12	89
Totals this sheet	232	179	3	356	49	9	231	125	39	19	184	145	20	24	41	414
Totals sheets	930	958	10	1700	171	27	1220	474	112	92	989	571	81	130	126	1898
Totals	1162	1137	13	2056	220	36	1451	599	157	111	1173	716	101	154	167	2312

Digitized by Google

TABLE C.

CAUSES OF DEATH.	No. Cases	AGES												
		Under 1 yr.	Between 1 & 5 years	5-10 years	10-15 years	15-20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	70-80 years	80-90 years	Over 90 yrs.	Not stated
I.—Specific Febrile or Zymotic Diseases.															
A.—Miasmatic Diseases.															
1 Small-pox															
2 Varioloid															
3 Chicken-pox															
4 Measles	54	18	14	8	7	2	1	4			1				4
5 Scarlet fever	4	1	1	1	1										
6 Typhus fever	80		6	4	4	3	60	2	1	1	1				2
7 Influenza	1		1												
8 Mumps															
9 Diphtheria	46	1	15	15	8	6			1						
10 Cerebro spinal fever	20	7	10	2	1										
11 Whooping cough	15	9	5	1											
12 Continued fever	3		2								1				
13 Enteric fever	80	1	5	7	18	12	18	11	4	4	2	3			
14 Yellow fever															
15 Other miasmatic diseases	14	1	2		1		1	2	2	2	2	1			
B—Diarrhetic diseases.															
16 Cholera infantum	83	54	28	1											
17 Cholera morbus	5		2				1		1		1				
18 Winter cholera															
19 Diarrhea	25	8	3			1				2	2	5	4		
20 Dysentery	40	10	15		2		1	3	1	1		5	1		1
C—Malarial diseases.															
21 Intermittent fever	2						1		1						
22 Remitte t fever	10		2				3	4		1					
23 Congestive fever	1				1										
24 Other malarial diseases	11	1	5	3		1						1			
D—Zoogenous diseases.															
25 Hydrophobia															
26 Other zoogenous diseases															
E—Veneral diseases.															
27 Syphilis	3					1	1	1							
28 Other veneral diseases															
F—Septic diseases.															
29 Phagedena															
30 Erysipelas	14	5	2	1			1	1	1	1	1	2			
31 Pyemia	3						1					2			
32 Septicemia	6					1	4			1					
33 Puerperal fever	9					1	6	1	1						
II—Parasitic diseases.															
34 Thrush	1	1	1												
35 Hydatids															
36 Worms															
37 Trichiniasis															
38 Other parasitic diseases	4	3	1												
III—Dietic diseases.															
39 Starvation	2	2													
40 Scurvy															
41 Alcoholism	5								3	1	1				
42 Delirium tremems	1								1						
Totals this sheet		117	119	45	38	28	44	29	17	14	12	19	5		7

Digitized by Google

TABLE C—*Continued.*

CAUSES OF DEATH.		AGES.													
		Under 1 yr.	Between 1 & 5 years	5-10 years	10-15 years	15-20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	70-80 years	80-90 years	Over 90 yr's.	Not stated
IV—*Constitutional Disease.*															
	No. Cases.														
43 Rheumatic fever	2	1						1							
44 Rheumatic heart	4	1			1				1		1				
45 Rheumatism	10			1				2		1	2	2	2		
46 Gout															
47 Rickets															
48 Cancer	15							2	2	2	2	3	2		2
49 Tabes mesenterica	5	3			1				1						
50 Tubercular meningitis	28	8	13	1	3	2	1								
51 Phthisis	274	6	6	6	8	28	82	52	26	24	21	10	2	1	6
52 Scrofula	17	4	3	1	2	2	2				2				1
53 Purpura	1		1												
54 Anæmia	1							1							
55 Diabetes mellitus	5			1						1	1	1			1
56 Other constitutional dis.	26	7	2	1		2	1	4	4	2		2	1		
V—*Developmental Diseases.*															
57 Premature birth	22	22													
58 Atelectasis	2	1		1											
59 Cyanosis	14	10	2												2
60 Spina bifida	2	1													1
61 Other congenital defects.	7	7													
62 Umbilical hemorrhage	3	3													
63 Old age	50									1	1	18	23	5	2
VI—*Local Diseases.*															
A—*Nervous System.*															
64 Inflammation of brain	45	18	11	2	4	3	6	2		1	1			1	1
65 Apoplexy	30				1			2	2	5	10	2	4	1	3
66 Softening of brain	10							1	1	2	1	3	2		
67 Hydroc'ph'lus, not acute	5		4	1											
68 Hemiplegia	8					1					5	2			
69 Paralysis agitans	11								1		2	4	3		1
70 Gen paralysis of insane	8						2	1	2		1	2			
71 Paraplegia	7					1	1		1				1		
72 Chorea	2		1			1									
73 Epilepsy	11	1	2			3	1	4							
74 Convulsions	32	19	9		2		1	1							
75 Trismus nascentium															
76 Tetanus															
77 Diseases of spinal cord	19	6	4	2	3			1			1		1		1
78 Other disea's, nerv's sys.	44	8	7	2		1	4	2	1	3	4	6	3		3
B—*Organs of Special Sense.*															
79 Epistaxis															
80 Oth'r dise's, nose, ear, eye	3	1	1									1			
C—*Circulatory System*															
81 Endocarditis	2						1					1			
82 Pericarditis	1							1							
83 Hypertrophy of heart	6	1				1					1	2	1		
84 Angina pectoris	13				1	2				1	3	2	3	1	
85 Valve-disease of heart	62	4	1		3	1	3	5	6	8	11	9	5	1	4
86 Syncope	3									2			1		
87 Aneurism	1									1					
Totals this sheet		127	67	19	29	48	105	82	48	54	70	73	54	10	27
Totals sheet A		117	119	43	38	28	44	29	17	14	12	19	5		7
Totals		244	186	62	67	76	149	111	65	68	82	92	59	10	34

Digitized by Google

TABLE C.

CAUSES OF DEATH.	No. cases.	AGES. Under 1 yr.	Between 1 & 5 years	5-10 years	10-15 years	15-20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	70-80 years	80-90 years	Over 90 y'rs.	Not stated
88 Senile gangrene	9	.....	.....	.....	.....	...	.....	2	.....	.....	2	2	1	.....	.....
89 Embolism	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
90 Phlebitis	2	.....	.....	.....	.....	.....	1	...	.....	1	.....	.....	.....	.....	.....
91 Varicose veins	...	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	.....	.....	.....
92 O'ter dis., circulat'y sys.	17	.....	.....	.....	.....	1	3	.....	4	2	2	4	1	.....	.....
D—Respiratory System.															
93 Laryngitis	4	1	1	2	.....	.....	...	....	.....	.....	.....	.....	.....	.....	.....
94 Croup	33	9	19	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
95 Oth'r dis., larynx & trach	3	1	.....	.....	.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....
96 Emphysema	1	....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
97 Asthma	6	.....	.....	.....	.....	.....	.....	1	1	1	.....	2	....	.....	1
98 Bronchitis	44	18	9	1	.....	3	2	.....	2	2	4	3	...	.....	.....
99 Pneumonia	193	39	30	9	5	9	5	12	12	8	17	20	8	1	18
100 Typhoid pheumonia	38	1	1	1	.....	8	8	6	2	.....	7	8	....	.....	2
101 Pleurisy	3	.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	.....	.....	.....
102 Oth'r dis., respirat'y sys.	41	5	4	2	1	2	8	4	1	5	5	2	....	.....	2
E—Digestive System.															
103 Stomatitis	4	.....	1	.....	.....	.....	.....	.....	.....	....	.....	2	.....	.....	1
104 Dentition	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
105 Sore throat	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....
106 Dyspepsia	...	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....
107 Hematemesis	...	.....	.....	...	.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....
108 Melana	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
109 Disease of stomach	25	2	2	1	2	.....	1	1	1	3	8	1	2	.....	1
110 Enteritis	16	4	3	1	1	....	3	1	....	1	1	.....	.....	.....	1
111 Ulceration of intestines	9	.....	3	1	.....	1	1	1	....	.....	1	1	.....	.....	.....
112 Ileus	1	.....	.....	.....	... ..	.....	.....	.....	.....	1	....	.....	.....	.....	.....
113 Strict. and strang. intes's	6	....	1	.....	.....	1	.....	1	.....	.....	3	.....	.....	.....	.....
114 Intussusception	6	.....	1	.....	....	1	1	.....	1	.....	.....	2	.....	.....	.....
115 Hernia	6	.....	.....	.....	.....	.....	1	.....	....	1	1	2	.....	.....	1
116 Fistula	1	.....	.....	.....	...	.....	.....	.....	.....	1	.....	....	.....	.....	.....
117 Peritonitis	20	1	.....	1	.....	3	6	3	4	2	1	.....	.....	.....	.....
118 Ascites	1	...	.....	...	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
119 Gallstones	1	.....	.....	.....	.....	.....	1	.....	.....	...	.....	.....	.....	.....	.....
120 Jaundice	11	8	.....	.....	.....	.....	1	.....	.....	1	....	.....	.....	.....	1
121 Cirrhosis	4	.....	.....	.....	.....	.....	2	.....	.....	...	1	1	.....	.....	.....
122 Other diseases of liver	20	...	.....	...	....	.....	4	3	4	3	3	3	.....	.....	.....
123 Other dis. digestive sys.	18	5	2	....	1	.....	.....	1	1	1	5	.....	1	.....	1
F—Lymphatic System.															
124 Disease of lymphatics	1	.....	.....	.....	.....	.....	....	.....	.....	....	.....	1	.....	.....	.....
125 Disease of spleen	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G—Gland like Organs of Uncertain Use.															
126 Bronchocele	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
127 Addison's disease	...	....	.....	....	.....	.....	.....	.....	.....	.....	.....	...	.....	.....	
H—Urinary System.															
128 Neprtiis	8	.....	.....	.....	1	.....	1	1	2	.....	1	1	.....	.....	.....
129 Bright's disease	32	.....	.....	.....	2	.....	3	3	1	2	9	8	2	.....	1
130 Uremia	5	.....	....	.....	.....	.....	1	.....	1	....	1	1	1	.....	.....
131 Suppression of urine	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
132 Calculus	2	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
133 Hematuria	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Totals this sheet	595	95	78	24	14	31	50	41	37	37	73	67	17	1	30
Totals sheets A and B	...	244	186	62	67	76	149	111	65	68	82	92	59	10	34
Totals	...	339	264	86	81	107	199	152	102	105	155	159	76	11	64

Digitized by Google

TABLE D.

CAUSES OF DEATH.	No. Cases.	AGES. Under 1 yr.	Between 1 & 5 years	5-10 years	10-15 years	15-20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	70-80 year	80-90 years	Over 90 yrs.	Not stated
134 Dis. of blad'r & prostate	2								1				1		
135 Oth'r dis. urinary sys'm	11						1		3	3	1	3			
I.—Reproductive Organs.															
a. Organs of Generation.															
136 Ovarian disease	4							1			1	1	1		
137 Dis. uterus and vagina	6								1	1	2	1			1
138 Disord'rs menstruation	3					2	1								
139 Pelvic abscess															
140 Perineal abscess															
141 Dis. of testes, penis, etc.	2						1			1					
b. Parturition.															
142 Abortion															
143 Miscarriage	1							1							
144 Puerperal mania	5						3	2							
145 Puerperal convulsions	7					1	4	2							
146 Placenta prævia															
147 Flooding	2								1						1
148 Phlegmasia dolens															
149 Other complications of childbirth	10					1	3	3	1						2
K.—Locomotor System.															
150 Caries and necrosis	1						1								
151 Arthritis	1					1									
152 Ositis															
153 Oth'r dis. locomotor sys.	1					1									
L.—Integumentary System.															
154 Carbuncle	2									1					1
155 Phlegmon															
156 Lupus															
157 Ulcer															
158 Eczema															
159 Pemphigus	1	1													
160 Other dis. integumentary system	1	1													
VII.—Violence.															
161 Railroad accident	18				3	1	5	2	3	1	1				2
162 Other accident	62	8	10	7	5	8	4	6	2	6	1	2	1		4
163 Homicide	4					1		1		1		1			
164 Suicide	2										2				
165 Execution															
VIII.—Otherwise Unclassified.															
166 Dropsy	28	3			1	1	4	2	4	2	5	5	1		
167 Debility	41	17	1		1			1	2	1	9	4			5
168 Atrophy from inanit'n	3	2	1												
169 Mortification															
170 Tumor	1		1												
171 Abscess	6	1			1		3		1						
172 Hemorrhage	9	2			2		1	1	1					1	1
173 Sunstroke	3		1										2		
174 Sudden, not stated	4		1							1		2			
175 Ill-defined	84	25	3	2	1	2	4	6	9	11	8	6	1		6
176 Unknown	89	30	5	3	2	3	7	3	12	8	5	5	1		5
Totals this sheet		90	23	11	13	22	37	35	33	39	30	34	17	1	29
Totals sheets A, B and C		339	264	86	81	107	199	152	102	105	155	159	76	11	64
Totals	2312	429	287	97	94	129	236	187	135	144	185	193	93	12	93

Digitized by Google

TABLE D.

CAUSES OF DEATH.	MONTHS.												
	January.....	February....	March.....	April.....	May.....	June.....	July.....	August.....	September...	October.....	November...	December....	Totals.....
1.—*Specific Sebrile or Zymodic Dis.*													
A.—Miasmetic diseases.													
1 Small pox													
2 Varioloid													
3 Chicken pox													
4 Measles	2	9	10	13	4	5	2		1	3		5	54
5 Scarlet fever	1	1				1						1	4
6 Typhus fever	2	1	8	1		2	2	2	5	4	3	5	30
7 Influenza							1						1
8 Mumps													
9 Diptheria	3	3	3	3			1	2	7	6	8	10	46
10 Cerebro-spinal fever	2	1	1	3	4	3		2	2	2			20
11 Whooping-cough	1		1	3	2	2		1		3		2	15
12 Continued fever		2					1						3
13 Enteric fever	6	5	9	6	5	9	6	11	7	9	3	5	80
14 Yellow fever													
15 Other miasmatic diseases	1		1	3	1	2	2		1	1		2	14
B.—Diarrhetic diseases.													
16 Cholera infantum		2	1			10	26	19	18	5	2		83
17 Cholera morbus							2	1	1			1	5
18 Winter cholera													
19 Diarhoea	2		2	1		2	6	2	4	4		2	25
20 Dysenterry	1			2		5	9	8	3	9	3		40
C.—Malarial diseases.													
21 Intermittent fever					1			1					2
22 Remittent fever		1	1	1	1		1	1		3		1	10
23 Congestive fever								1					1
24 Other malarial diseases		1	2			2	2		2			2	11
D.—Zoogenous diseases.													
25 Hydrophobia													
26 Other zoogenous diseases													
E.—Venereal diseases.													
27 Syphilis			1					1			1		3
28 Other venereal diseases													
F.—Septic diseases.													
29 Phagedena													
30 Erysipelas	2	1		2	2	2	1		2		2		14
31 Pyemia			1		1	1							3
32 Septicemia	1		2	1	1							1	6
33 Puerperal fever	2	1				1	1	1		2		1	9
II—Papas tic diseases.													
34 Thrush	1												1
35 Hydatids													
36 Worms													
37 Trichiniasis													
38 Other parasitic diseases							1	1	1			1	4
III—Dietic diseases.													
39 Starvation			1							1			2
40 Scurvy													
41 Alcoholism	2			1						2			5
42 Delirium tremems										1			1
Totals this sheet	29	28	39	40	22	47	64	54	54	55	21	39	

Digitized by Google

TABLE D.—*Continued.*

CAUSES OF DEATH.	MONTHS.												Totals.
	January.	February.	March	April	May	June	July	August.	September.	October.	November.	December.	
IV—Constitutional diseases.													
43 Rheumatic fever				1			1						2
44 Rheumatic heart	1		1							1		1	4
45 Rheumatism		1	1	2		1	1			4			10
46 Gout													
47 Rickets													
48 Cancer		2	1	1	3	1	1		3	1	1	1	15
49 Tabes mesenterica					1		2			1		1	5
50 Tubercular meningitis	2	2	5	6	1	5	2	1	1	1	1	1	28
51 Phthsis	31	36	32	21	21	25	15	13	14	22	23	21	274
52 Scrofula	2	5	1	3	1	1		1	1		1	1	17
53 Purpura	1												1
54 Anemia						1							1
55 Diabetus melitus	1			1			1	1			1		5
56 Other constitutional diseases	1	4	1	3	2	6	1	3	1	2	1	1	26
V—Developmental diseases													
57 Premature birth	2		2	2	1	4	1	2		5	2	1	22
58 Atelectasis		1								1			2
59 Cyanosis	3	1	1	2		3		3			1		14
60 Spina bifida											1	1	2
61 Other congenital defects	1	2	1	1	2								7
62 Umbilical hemorrhage	1									1	1		3
63 Old age	7	5	7	5	4	6	2	2	2	4		6	50
VI—Local diseases.													
A—Nervous system.													
64 Inflammation of brain	6	2	7	3	5	6	3	1	2	2	1	6	45
65 Apoplexy	3	5	6	1	1	2		3		5	2	2	30
66 Softening of brain	2	1	1	2		2	1	1					10
67 Hydrocephalus, not acute			1		1	1		1			1		5
68 Hemiplegia	1		2	2	2	1							8
69 Paralysis agitanus	1	1	4	1	1		1			1	1		11
70 General paralysis of insane	1	1	2	1						2		1	8
71 Paraplegia	2		1		2		1			1			7
72 Chorea					1		1						2
73 Epilepsy	1	1	3		1			1	1	1	1	1	11
74 Convulsions	4	4	5	3	3	3	3	1	2	2	1	1	32
75 Trismus nascentium													
76 Tetanus													
77 Diseases of spinal cord	1	2	2	4	1		1	2	2	3	1		19
78 Other diseases. nervous system.	5	6	2	3	5	2	4	4	4	4	3	2	44
B—Organs of special sense.													
79 Epistaxis													
80 Other diseases, nose, ear and eye	2					1							3
C—Circulatory system.													
81 Endocarditis	1	1											2
82 Pericarditis									1				1
83 Hypertrophy of heart				2	1					1	1	1	6
84 Angina pectoris			3			1	1	1		2	2	3	13
85 Valve-disease of heart	6	7	7	6	2	8	2	3	4	7	4	6	62
86 Syncope	1	1									1		3
87 Aneurism									1				1
Totals this sheet													
Totals sheet A													
Totals													

Digitized by Google

TABLE D—*Continued.*

CAUSES OF DEATH.	MONTHS.												TOTALS.
	January	February	March	April	May	June	July	August	September	October	November	December	
88 Senile gangrene		1		1		3		1			1		7
89 Embolism		1											1
90 Phlebitis	1											1	2
91 Varicose veins													
92 Other diseases, circu'tory sys.	2	2	1	2				1		2	3	4	17
D—*Respitory System.*													
93 Laryngitis	2	1										1	4
94 Croup	3	5		2	1	1	1		1	3	9	5	33
95 Other dis'ase, larynx, trachea	1	1								1			3
96 Emphysemia										1			1
97 Asthma		2			1		1		1	1			6
98 Bronchitis	7	6	8	4	3	1	2	2	3		2	6	44
99 Pneumonia	35	41	36	27	8	6	5	4	5	3	11	12	193
100 Typhoid pneumonia	4	3	6	6	6	3		3	4		1	2	38
101 Pleurisy		1			1					1			3
102 Other dis. respi'tory system	8	4	5	2	2	2	1	5	1	3	3	5	41
E—*Digestive System.*													
103 Stomatitis	1			1								2	4
104 Dention											1		1
105 Sore throat								2					2
106 Dyspepsia													
107 Hematemests													
108 Melana													
109 Disease of stomach	2	3	1	2	2	1	1	3	2	3	3	2	25
110 Enteritis	4	3	1			1			1	1		2	16
111 Ulceration of intestines	1	1						1	1	2	1	2	9
112 Ileus				1									1
113 Stric't. & strang'n of intistin's	1	1					1		1	1		1	6
114 Intussusception	2			1	1			1				1	6
115 Hernia	1	1		2		1		1					6
116 Fistula											1		1
117 Peritonitis	3	3		3	1	2			1		2	5	20
118 Ascites									1				1
119 Gallstones	1												1
120 Jaundice	2		1	2	2	3				1			11
121 Cirrhosis	2								2				4
122 Other disease of liver	2	2	2	5	1			1	1	1	1	4	20
123 Other diseases, digestive sys.	3	2	2	1		1	2	4	2	1			18
F—*Lymphatic System.*													
124 Disease of lymphatics		1											1
125 Disease of spleen													
G—*Gland-like Organs of Uncertain Use.*													
126 Bronchoele													
127 Addison's disease													
H—*Urinary System.*													
128 Nepritis		1	2							1	1	3	8
129 Bright's disease	4	3	4	2	6	2	1	1	2	2	2	3	32
130 Uremia	1			1		1				2			5
131 Suppression of urine					1								1
132 Calculus						1						1	2
133 Hematuria			1										1
Total this sheet													
Totals sheet A. and B													
Totals													

Digitized by Google

TABLE D.—*Continued.*

CAUSES OF DEATH.	MONTHS.												TOTALS
	January	February	March	April	May	June	July	August	September	October	November	December	
134 Disease of bladder and prostate				1					1				2
135 Other diseases, urinary system	1	1	1	1	1			2		3		1	11
I—*Reproductive Organs.*													
a. Organs of Generation.													
136 Ovarian disease		1					1			2			4
137 Disease of uterus and vagina			1		3		1			1			6
138 Disorders of menstruation	1				1						1		3
139 Pelvic abscess													
140 Perineal abscess													
141 Diseases of testes, penis, &c	1						1						2
b. Parturition													
142 Abortion													
143 Miscarriage	1												1
144 Puerperal mania	2		1		1							1	5
145 Puerperal convulsions			2						1	3	1		7
146 Placenta prævia													
147 Flooding		1			1								2
148 Phlegmasia dolens													
149 Other complicat's of childbirth					2	1	1		2	4			10
K—*Locomotor System.*													
150 Caries and necrosis								1					1
151 Arthritis		1											1
152 Ostitis													
153 Other dis., locomotor system										1			1
L—*Integumentary System.*													
154 Carbuncle		1						1					2
155 Ph egmon													
156 Lupus													
157 Ulcer													
158 Eczema													
159 Pemphigus		1											1
160 Other dis., integumentary syst.								1					1
VII—*Violence.*													
161 Railroad accident		1	4	1	1	1	1	1	4	1	2	1	18
162 Other accident	5	4	3	10	8	10	4	5	4	3	5	1	62
163 Homicide				1	2	1							4
164 Suicide											2		2
165 Execution													
VIII—*Otherwise Unclassified.*													
166 Dropsy	1	1	2	6	1	4	2	1	2	4	2	2	28
167 Debility	6	7	5	2	1	4	4	2	4	1	4	1	41
168 Atrophy from inanition					2				1				3
169 Mortification													
170 Tumor									1				1
171 Abscess	3	1					1		1				6
172 Hemorrhage	1	1	1	2				1	1	1	2		9
173 Sun-stroke							1	2					3
174 Sudden—not stated	1	2	1										4
175 Ill-defined	5	17	5	6	12	11	3	5	7	4	9	5	84
176 Unknown	15	7	9	7	8	6	7	5	5	6	8	6	89
Totals this sheet													
Totals 4sheets A, B and C													
Totals	257	247	240	212	179	188	163	151	170	188	143	190	2312

Digitized by Google

MARRIAGES.

COUNTIES.	July	August	September	October	November	December	January	February	March	April	May	June	Total
Barbour	4	7	4	15	20	13	6	10	9	8	7	1	104
Berkley	8	2	10	10	11	14	14	9	12	17	14	7	118
Boone	1	3	4	6	3	8	6	4	5	3	3	5	51
Braxton	6	4	6	5	5	14	3	5	6	4	7	1	66
Cabell	10	10	12	12	26	26	12	14	14	13	18	18	179
Calhoun	2	3	13	12	4	8	8	9	7	7	7	3	83
Doddridge	6	9	8	6	4	12	6	5	9	7	4	5	81
Fayette	9	8	20	21	10	36	14	8	9	12	17	19	183
Gilmore	1	5	8	12	7	14	5	3	13	4	8	2	82
Grant	.....	2	5	3	3	4	1	1	7	2	3	.....	31
Greenbrier	7	8	8	16	22	15	6	7	11	12	8	9	129
Hampshire	1	3	7	6	6	10	4	6	6	4	5	1	59
Hardy	3	2	6	6	8	12	4	5	2	6	4	5	63
Kanawha	34	24	24	35	32	45	24	27	32	26	38	35	376
Lewis	9	6	18	11	9	8	5	7	13	10	5	14	115
Marion	8	8	15	19	17	18	10	9	14	15	10	6	149
Mason	12	20	23	26	16	23	7	8	12	21	10	10	188
Mercer	10	6	6	6	9	15	11	14	13	9	13	7	119
Mineral	t	9	4	4	5	10	6	2	8	7	7	12	80
Monongalia	.....	6	23	7	2	10	7	7	10	10	7	12	101
Pleasants	3	7	6	6	4	12	4	13	9	4	3	6	77
Raleigh	3	8	8	17	8	5	3	8	8	10	6	3	87
Ritchie	10	11	18	10	14	17	8	11	11	11	9	5	135
Taylor	4	5	1	11	9	9	7	7	4	13	9	6	87
Tucker	8	7	4	3	4	6	2	1	3	5	1	7	51
Tyler	6	16	13	14	10	11	3	10	8	12	7	10	120
Upshur	4	11	8	12	7	11	8	10	4	9	8	9	101
Wayne	18	10	8	16	15	17	11	11	19	15	12	8	160
Wetzel	6	16	15	12	18	20	12	10	18	18	6	17	168
Wirt	6	8	8	9	9	14	6	6	7	20	3	4	100
Wood	14	14	15	20	26	28	9	14	13	23	13	15	194

Digitized by Google

Return of Births by Counties.

COUNTIES.	Mothers under 20		Mothers between 20 & 25		Mothers between 25 & 30		Mothers between 30 & 35		Mothers between 35 & 40		Mothers between 40 & 45		Mothers between 45 & 50		Mothers over 50	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Barbour	13	9	19	28	34	20	13	19	11	9	4	6	1	2	.....	.....
Berkeley	10	14	33	45	40	42	35	43	24	18	8	5	1	.....	.....	.....
Boone	6	6	9	10	6	2	8	4	t	1	1	2	1	.....	.....	.....
Braxton	8	4	7	9	9	8	2	6	4	7	1	1	1	.....	.....	.....
Brooke	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cabell	18	12	42	30	32	22	28	20	15	16	4	5	.....	.....	.....	.....
Calhoun	8	2	12	13	12	19	12	18	8	8	6	2	.....	.....	.....	.....
Clay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Doddridge	11	5	31	27	21	31	12	25	13	11	6	5	1	1	.....	.....
Fayette	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gilmer	11	4	21	21	10	15	18	18	9	5	3	2	2	.....	.....	.....
Grant	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greenbrier	3	4	6	6	16	9	4	5	3	1	6	3	.....	.....	.....	.....
Hampshire	.....	.....	1	1	1	1	.....	.....	2	.....	.....	2	.....	.....	.....	.....
Hancock	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardy	1	.....	7	7	9	10	7	2	5	2	1	1	.....	.....	.....	1
Harrison	6	5	36	46	31	47	39	21	23	25	6	3	.....	1	.....	.....
Jackson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kanawha	3	6	20	15	14	17	8	13	9	6	1	1	.....	.....	.....	.....
Lewis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lincoln	1	2	.....	.....	1	3	.....	.....	1	2	.....	1	.....	.....	.....	.....
Logan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion	9	11	35	23	30	30	22	16	19	9	7	8	.....	.....	.....	.....
Marshall	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mason	12	15	25	26	24	24	14	12	14	18	7	5	.....	.....	.....	.....
Mercer	5	1	16	5	5	6	4	8	1	1	2	1	1	.....	.....	.....
Mineral	8	10	34	22	20	44	26	25	12	24	7	7	.....	.....	.....	.....
Monongalia	5	6	27	26	26	19	20	10	14	13	4	7	2	1	.....	.....
Monroe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
McDowell	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nicholas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pendleton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pleasants	2	1	7	7	6	8	3	3	1	1	1	.....	.....	.....	.....	.....
Pocahontas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Preston	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Putnam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Raleigh	2	1	3	3	4	3	2	1	2	3	1	.....	.....	.....	.....	.....
Randolph	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ritchie	8	9	30	13	26	20	19	19	12	14	5	7	3	2	.....	.....
Roane	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Summers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Taylor	8	8	28	32	31	31	17	26	17	14	6	4	.....	.....	.....	.....
Tucker	3	3	10	8	9	4	4	3	6	6	1	3	1	3	.....	.....
Tyler	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Upshur	6	9	21	19	31	28	13	15	16	17	3	6	.....	.....	1	.....
Wayne	2	2	6	4	2	....	1	.....	2	1	.....	.....	.....	.....	.....	.....
Webster	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wetzel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wirt	4	3	10	9	7	4	2	2	4	1	1	.....	1	.....	.....	.....
Wood	4	4	21	22	19	19	14	14	14	13	5	6	1	.....	.....	1
Wyoming	13	11	23	24	16	16	1	9	7	6	5	6	.....	.....	.....	.....

*Total, 652; white, 644; black, 8; males, 323; females, 323; not stated, 6.

Digitized by Google

BIRTHS BY COUNTIES.	Native Mother and Father.	Native Mother and Foreign Father.	Foreign Mother and Native Father.	Foreign Mother and Father.
Barbour	156	4	.....	30
Berkeley	308	5	1	5
Boone	60	.....	.....	.....
Braxton	103	.....	.....	.....
Cabell	230	6	3	5
Ca houn	112	.....	.....	1
Doddridge	207	.....	.....	1
Gilmer	126	1	.....	2
Greenbrier	65	1	.....	.....
Kanawha	107	5	1	8
Hampshire	11	.....	.....	.....
Hancock	144	.....	.....	.....
Hardy	53	.....	.....	.....
Harrison	273	6	3	7
Lincoln	11	.....	.....	.....
Marion	215	4	.....	.....
Mason	246	10	3	28
Mercer	87	2	.....	1
Mineral	229	14	5	31
Monongalia	190	.....	.....	.....
Ohio	652	.....	.....	.....
Pleasants	28	11	1	.....
Raleigh	24	.....	.....	.....
Ritchie	185	1	4	1
Taylor	219	7	3	6
Tucker	61	.....	.....	3
Upshur	191	.....	.....	4
Wayne	20	.....	.....	.....
Wirt	48	.....	.....	.....
Wood	124	6	1	5

Digitized by Google

HOG CHOLERA—SWINE PLAGUE.

Hog cholera or swine plague is a specific infectious disease, peculiar to swine only, and originates in a specific micro-organism. Its source of primary and original development is in the earth and earthy or refuse matters, whence the swine become infected and again in turn infect the same kind of material through their excreta, or it may be through their dead bodies. The disease is a blood poison induced in the swine by means of a secretion from specific germs, hence it is a septicaemia and it is an extra organismal septicaemia, because it finds its primary origin outside the animal organism. It is infectious, but not contagious. Its secondary lesions are pneumonia, and those of the large intestine; though bronco pneumonia, and certain intestinal lesions may occur about the same time as the septicaemia, when the infecting organisms gain an entrance by either of these tracts. The disease is extensively distributed over the temperate portion of the North American continent. No State seems to be exempt from it, whilst it prevails to a greater extent in the Middle Western States than in those North and South, and those East and West of this section. In no single State is the annual loss from this disease approximately known. The disease is known to prevail in Great Britain, and on the continent of Europe. It was first recognized in this country between 1840 and 1850. The scientific investigation of the disease is of very recent date. It has been charged that it is of American origin, but the evidence is against such charge; and it is more than probable that it was known to the ancients, as among the diseases of animals described by Aristotle is one of swine that will pass as a fair description of the disease under consideration. Hog cholera is a specific disease dependent upon a specific germ. As has been already said, it is dependent for its origin upon an extra organismal micro-organism whose natural habitat is in the earth, and earthy or refuse material. Its primary source is always in the earth, and earthy material, and never in the hog until it has en-

Digitized by Google

tered it, and infected it from these outside media. *The causes* of swine plague are everything that can exert an influence in extending the disease over a section of country by dispersing its specific cause, or anything that can possibly protect or support the life of that cause—the specific germ upon which it is dependent. Among the causes the first in importance is the diseased swine, then the pens or yards in which such have been; material conveyed from such pens or yards to other places which offer favorable conditions for the preservation of the life of the specific cause, or for its further development; anything which can convey such material—persons who visit their neighbor's hog yards after being in infected pens, dogs, fowls, rats, &c. The conveyances of common carriers, cars, wagons that have been used to convey diseased swine, or manure or straw from infected pens, the dead bodies of infected swine, and water courses running through infected yards. Could all these and other causes of distributing infection be thoroughly dealt with, there would be but little trouble in wiping the disease out of existence; but it has been known for years that the disease was infectious, and that its extension was due to the causes above enumerated. The fault is partly due to the indolence and carelessness of the parties interested, and partly to the want of authoritative direction on the part of some governing body.

The disease is a specific eruptive fever peculiar to the hog. It does not necessarily attack all animals exposed to it, nor is it always equally fatal. The incubative period of the disease is naturally about ten or twelve days, but it may develop in less time. Its duration may extend from two or three days to as many weeks or even months; though it may prove fatal in as many hours from the time when the animal is first noticed to be sick. Its invasion may be very pronounced or its special and characteristic symptoms may be slowly and insidiously developed. I have said it is a specific eruptive fever. In the earliest stages there is more or less fever, the temperature is elevated, the pulse increased in frequency, the bowels may be either constipated or relaxed, and there is a husky bronchitic cough. The animals seek to isolate themselves. They seek warmth by burrowing in the straw or litter. When lying down they refuse to rise, or rise stiffly and unwillingly and move with an awkward gait, and soon exhibit evidences of exhaustion. The ears frequently lop over and present a congested appearance. The conjunctiva is injected and there is frequently a lachrymation, or discharge from the eyes of a glutinous mucus, which, with the dust or dirt adhering to it gives to the animal a peculiar frowsy look. In the more advaced stages the above symptoms become aggravated and more pronounced. The temperature rises, the pulse becomes more rapid, the breathing more hurried and jerky, the urine scanty and high colored, frequently emitting a peculiar and characteristic odor, weakness increases and the movements become more unsteady. Food is refused, or taken very sparingly,

Digitized by Google

though there may be great thirst. The irregularity of the bowels becomes more marked, the faeces become of a dark color, pasty and of a very unpleasant but characteristic odor. There may be some blood discharged from the eyes and nostrils. Should the bowels become inflamed, a diarrhœa replaces constipation, the discharges being of a dirty chocolate, or yellow ochre color, with the above mentioned characteristic odor. At other times, when the bowels are constipated, the contents accumulate in the large intestine, undergo decomposition, liberate sulphuretted hydrogen gas, and produce tympany with distension. When the lungs are affected the breathing becomes labored and hurried and the cough becomes distressing, with catarrhal discharge from the nose and eyes. There is often a short, hollow grunt made in breathing; and examination of the chest shows signs of consol idation. The skin of the ears and abdomen is frequently purplish and the extremities cold; not unfrequently a bloody foam issues from the nostrils and the breathing becomes gasping. Sometimes the brain is involved and the animal presents a stupid appearance, wanders aimlessly about and staggers like a drunken man, often falls helplessly, or if excited, is thrown into convulsions. At times the head is bored into a corner or thrust into the litter, producing stertor. If the spinal cord or its membranes are affected, there will be muscular twitchings, spasm, and partial, followed by total, paralysis. The external local lesions will be found in the skin; they consist of discolorations, vesications and pustulations, sloughs and desquamation. The discolorations vary from pale blue or light red to a dark, livid blue, purple or black. At times there may be merely a slight erythematous blush on the skin of the abdomen, the vulva, the hocks, the ears, the throat, or the inside of the thighs, or only a little blueness of the ears. The discoloration may be diffuse, or in discrete patches. Exciting the animal or lifting it by the hind legs will increase the discoloration. In a few days, or it may be in a few hours, the discolorations become more distinct, so in recovery it gradually fades away. A desquamation of the skin, or even a sloughing in patches may occur. Vesication and pustulation is rarely a primary lesion, generally coming on in the course of the disease. Sloughs are sometimes seen on the ears or on the back, and are due to capillary or haemorrhagic lesions. The tail is often lost, especially in young hogs. Desquamation is not peculiar to this disease, but may occur as a common result in any fever. The importance of a correct diagnosis in this disease cannot well be over rated, as upon it will depend the prevention or medical measures adopted. The diseases with which it is most likely to be confounded are pneumonia, purpura haemorrhagica, urtieoria, measles, eryesipelas, variola and anthrax. Practically, whenever a large number of hogs are found dying simultaneously over a large area of country with symptoms of bowel or pulmonary derang ment and with skin eruptions, it may safely be assumed that they are suffering from swine fever, as pigs are not in this country

Digitized by Google

subject to any other fatal malady of an epidemic type. In making a post mortem examination of a hog supposed to have died of swine plague, it is best to first remove the stomach and intestines and lay them aside until the carcass has been examined, for it is best to look first to the general condition of the tissues of the body, and the blood; next to the pulmonary lesions; then to the gastro-intestinal lesions, and the lymphatics. The appearance of the carcass will be modified by the fact as to whether the animal has died a natural death or been killed; as to whether the blood has been abstracted from the body, and whether the carcass has been properly dressed, scalded and scraped; for under such conditions the skin lesions will be more marked. If the hog has been well fed, and the duration of the disease short, there will not be much shown by the general condition of the carcass, but if the disease has lasted some time, and there has been much bowel or lung trouble, and emaciation has set in, the carcass will be pale, flabby and moist. The blood, in the early stages, and even in advanced stages, may not present any marked physical changes, or it may be dark in color, and thick and tarry in consistence; or it may resemble a mixture of red brick dust in some calloid substance. The systemic lesions are extravisations of blood, and effusion of serum and lymph. The skin extravisations may be confounded with bruises upon the surface from blows with sticks. The extravisations are rarely pronounced in the muscular tissue, but will be found in the inter-muscular spaces. The serous extravisation is common into the peritoneum, the pericardium, within the renal capsule, or within the sircus capsule of the liver or spleen, or within the cerebral meninges. The parenchymatous extravisation is sometimes very extensive, at others it is absent, though it will usually be found in the liver, spleen, and in the kidneys. Pulmonary lesions are neither constant, nor necessary. In the early stages the lesions are like those of pleuro pneumonia of an exudative or effusive type. In time the inflammation becomes circumscribed by the effused lymph, the surfaces of the inflamed space becomes raised above the surrounding level. The pleura becomes opaque and thickened, and masses of lymph are deposited on its external surface. On section the diseased lung is found to be solid and friable, charged with serum, red, black or gray, in color, (red, black, or gray hepatization,) increased in density and in specific gravity; decreased in resilience, and separated from the rest of the lung-structure by a distinct segregating band. The bronchial tubes and the trachea are often filled with serum or coagulated lymph. The small intestine shows a condition of hyperaemia or echymesis in the mucus and sub-mucus tissues, and serous coverings, which conditions apply to the stomach; but it is the large intestine which shows the most characteristic appearances. There are smaller or larger, isolated or confluent ulcerations at and around the ileo-caecal valve, the mucus membrane being hyperaemic even to echymosis. The

Digitized by Google

whole of the large intestine down to the rectum contains ulcers; in the coecum they are confluent and very extensive. The ulcers rarely tend to perforation. Ulcers in the stomach are rare. The typical ulcers of swine plague can hardly be confounded with lesions of any other malady. They are preceeded by small nodular formations in the mucusa, these producing rounded elevations on the surface, which may be felt by passing the hand over them. They are grayish in color, and at first discrete and resistent to the touch; after a time central softening takes place, followed by eruption, and the formation of distinct, small circular ulcers with jagged edges, and of a grayish, or grayish-yellow, or black color. Many of these ulcers remain discrete, while others coalesce and produce extensive ulcerated tracts of very irregular shape. Whilst these changes are taking place the coats of the bowel become very thick and hard and either black or dark red in appearance. The contents of the bowel may be simply fluid, or semifluid, dark in color, and of a peculiar sickly odor; or they may be found in the form of small concrete masses which adhere tenaciously to the mucus membrane, and when detached therefrom leave a roughened and sometimes an inflamed surface, or they may be found in the form of large masses of a very dark color, firm consistence, very cohesive and coated with a layer of mucus or mucus mixed with blood. Associated with the intestinal lesions there is frequently great engorgement of the mesenteric capillairies and sometimes mesenteric extravisation. The lymphatic glands show an alteration in their character very soon in the disease, and frequently serve to mark the disease when other symptoms are wanting. The mesenteric, hepatic and bronchial glands are most frequently found involved; also the glands along the descending aorta; the sternal and submaxillary glands. The glands are much swollen, firmer than natural, more or less red or even purple or black in color, and when cut into a considerable amount of red fluid oozes out. Changes occur in the mesenteric glands similiar to those described in other glands.

Prevention.—The failure to prevent this formidable disease is largely due to the ignorance, laziness and carelessness of the owners of hogs; because the prevention of its dissemination by the means heretofore mentioned rests largely with them. The best means of preventing the disease is in slaughtering diseased hogs and destroying them, and the thoroughly disinfecting the hog quarters, preferably by fire. When this can not be done the pens should be thoroughly cleansed and disinfected with the best germicidal agent. The hog should be kept in an inclosure free from accumulations of manure, straw, litter of any kind, or remains of dead hogs, in which the contagion may possibly be preserved. As hog cholera is an infectious disease, the chief and real seat of danger is where sick hogs are or have been. So don't leave a well hog where a sick one is or has been. Don't fail to examine the hogs frequently, and to separate the sick from the

Digitized by Google

well hogs. Don't allow the same person to take care of the sick and well hogs. Don't allow any intercourse of men, dogs or fowls between the pens of either lot of hogs. Don't put well hogs in a pen or upon land where hog cholera has been in less than three years, unless the same has been thoroughly cleansed of all refuse, ploughed or dug up several times and exposed to the air for an entire summer. Don't forget that closed pens, sheds, straw-stacks and accumulated litter are more dangerous than open country where swine plague has prevailed in such places. Don't water hogs from running streams. Don't place your pens or runs so they can drain into running streams. Don't forget that all such places should be well drained and kept as dry as may be possible. Don't bury dead hogs when you can burn them up. Don't sell or buy sick hogs. Don't visit your neighbor's hogs when sick or allow him to visit yours if well. Don.t forget that *watchfulness*, *carefulness* and diligence will do more to prevent swine plague than all medicines.

As to *treatment*, very little can be said of practical value, for whilst various modes of treatment hold out the hope of some recoveries, yet the risk to the well animals is so great that it seems best to accept the present, rather than to incur the risk of future greater loss. Yet if one will try it under proper precautions the following rules offer the best prospect of cure: Clear out the bowels with some purgative and follow this with sulphur and potash salts. When there is great depression and lung trouble, give carbonate of ammonia or some other stimulant. It may be well also to give sulphite of soda and chlorate of potash. The animals should be fed on easily digested food in the form of slops, and milk should be freely given. The hyposulphite of soda and chlorate of potash should be given to the well hogs when they have been exposed to the risk of contagion. Before closing, I desire to acknowledge my indebtedness to Frank S. Billings, Director of the Patho-biological Laboratory of the State of Nebraska, for the facts and inspiration of this article.

T. A. HARRIS, M. D.

Parkersburg, W. Va.

Digitized by Google

THE DRY-EARTH CLOSET SYSTEM.

Very few of the towns and villages of our State are blessed with a system of underground sewers, which make possible the use of water closets supplied with all the modern improvements; in consequence our people are forced to the old fashioned privy vault or garden house, with all its disagreeable odors and disease spreading gases. Prof. Victor G. Vaughan, in his essay entitled "Healthy Homes and Food for the Working Classes," says: "When there is no system of sewerage, the dry earth closet is the best method of disposing of human excrement; indeed, upon sanitary grounds the dry-earth system is in many respects more desirable than the use of water closets. but the former requires possibly more care than the latter. Economically also the dry-earth system will prove the better when it comes into more general use, and the excrement is used as a fertilizer. A dry-earth closet properly kept is free from all noxious gases, and there is no possibility of the drinking-water supply becoming contaminated from it."

There are many patterns of dry-earth closets in use, but the simplest may be made as efficient as the most complicated and costly. A cheap form is made by placing under the seat boxes or drawers lined with galvanized iron. There is placed conveniently a quantity of dry earth, and for each evacuation a small shovel of the earth (from one to two pounds) is thrown in. When the drawers are full they are removed, emptied and replaced. The best earth to use is pulverized clay mixed with about one-third its weight of loam. Ordinary garden soil may be used if dried perfectly. Sifted coal ashes are almost or quite as good as any earth. Moreover, they are generally on hand and to be disposed of in some way. The writer has used for his family a dry-earth closet for three years, and prefers the sifted coal ashes to any kind of earth. With an ordinary family with not more than half a dozen members, it is not necessary to empty the boxes more than once in three or four weeks. Their contents, which if enough soil or ashes has been added, is wholly inodorous and may be emptied upon the

Digitized by Google

garden. Here it is spaded in during the spring, and as a fertilizer amply repays for the time and trouble that has been taken with it. Several large cities in Europe have adopted the dry-earth system, and the waste is removed by those who desire to use it as a fertilizer.

The patent earth-closets are so arranged that the requisite amount of earth fall into the box in a manner similar to that by which the water-closet is flushed with water.

In case epidemics of any kind are prevailing in the neighborhood, it would be well to throw a handful of chloride of lime into the closet each day. And even when no epidemic prevails, but the weather is very hot. The same quantity of sulphurate of iron (copperas) may be used daily. The cost of this substance is so small that it may be used freely when needed. Where many are using the closet a vault may be dug beneath the seat and made water-tight with brick nnd cement. Into this should be thrown each day a sufficient quantity of dry earth, and the vault should be thoroughiy cleaned at least once a month.

The ordinary privy-vault, with porous walls, is an abomination. It has caused more deaths in this country than war and famine have produced. The liquid poisons from it filter into wells, while its gaseous exhalations float through the air. People breathe and drink their own excretions and typhoid fever and kindred diseases slay tens of thousands annually. It is safe to say that the privy-vault is the origin of the majority of the cases of typhoid fever. As the country becomes more thickly settled the dangers from the privy vault increase, and they should be wholly abandoned. In many places it is the custom to move the privy and cover the contents of the vau't with a few shovels of dirt as soon as the vault is filled. In this way from one to half a dozen repositories of filth are found in the average village back yard in a few years. Such a consideration is certainly a highly unsanitary one.

The conveniences for attending to the calls of nature in most of our public schools are of the most primitive character. A small building or shed, with a shallow pit, not even walled up, the seats and floors in a filthy condition, the sexes divided by a single board partition. Closets should be located in or in immediate connection with the school building, and when water-closets cannot be used the dry-earth closet should by all means be substituted. With all teachers the keeping of out-houses in a decent condition is a problem that has caused most anxious thought, and decently kept out-houses are the exception not the rule. By proper vigilance on the part of teachers much that is objectionable may be prevented, but with closets located outside of the building it is almost impossible to prevent all.

"Somebody has said that he could judge of the civilization of a people by the condition of their privies." Where would we stand if tested by this standard. What have we? The privy-vaults and cesspools are the same authorized by Moses, and have not been improved since the children of Israel crossed Jordan to

Digitized by Google

the promised land after the exodus. And without any intent of disparaging the sanitary regulations of the translated law-giver must say, after four thousand years of experience, that they are methods of hiding a poison, filling the earth with traps and snares to destroy those who follow us; that the germs of pestilence and death thus planted and cultured, carrying yearly victims to untimely graves, is the reproach of the system, and mankind cries aloud to be spared. The theory of the earth-closet is very simple, and easy of adoption. Instead of hiding away in pits and sinks, traps and snares for the unwary, the giant is strangled in its cradle by constant watchfulness and disinfectants.

Digitized by Google

THE STUDY OF HYGIENE IN SCHOOLS.

By Prof. A. B. Arnold, M. D.

The instinct of self-preservation is so immeasurably strong and imperative that the acts which carry out its promptings may be said to manifest an automatic character. A child will cry out and bury its head in the pillow at the sight of a strange face in apprehension of danger; in fact, the intensity of this intercourse never abates during the whole career of life. Like a faithful sentinel it never abandons its post, and gives the signal of warning on the slightest occasion. The correlative of this instinct—the desire of health—commands a far less emphatic response from the individual; there is none of that urgency exhibited in warding off injurious influences which marks the efforts to avert immediate peril to life. This difference is due to the tendency of human nature to dread a remote evil much less than a near one. To the same circumstance must be ascribed the frequency of the violation of the well-known laws of health, and also the long neglect of public hygiene and sanitation, which only in comparatively recent times began to challenge the attention of enlightened communities. It is true, there always existed in the popular mind a knowledge of the gross morbific influences that are preventible, but even this medium of information is overlaid and often made unavailable by a mass of false notions and prejudices. The physician who makes hygiene his special study is only called in for his advice and assistance when disease is already established, and not when it is in the making. It is to the lasting credit and honor of the medical profession that the diffusion of knowledge on the subjects of hygiene and sanitation was initiated and supported by its members, and the weight of their influence extended to those public-

Digitized by Google

spirited citizens who take an interest in these noble sciences and promote their practical application.

The efforts in the direction of public hygiene possess the one great advantage over what may be called private hygiene, that the former is a proper object of police regulations, while the latter is entirely a personal affair. Now it may be confidently maintained that no one of ordinary intelligence would knowingly and willingly violate the rules of health. It is, however, notorious how universally they are disobeyed and how indifferent the generality of mankind is to the penalties which are incurred by such neglect. Under these circumstances it would almost amount to a dereliction of duty to disregard the means which are at hand to impart and to diffuse a knowledge of the principles of hygiene in a most effectual way and in an unobtrusive manner. It will at once suggest itself that our public schools afford the desirable avenues of conveying such a knowledge.

In regard to the question of adding another item to the long list of studies in our schools, it may be safely asserted that the supreme importance of becoming familiar at an early period of life with the conditions that regulate the preservation of physical and mental health overrides all objections. If the numerous and often unsuspected causes that gradually but surely undermined the bodily constitution, and tend to plant the seeds of irremediable disorder, had been more widely known and considered, the acquirements of the science of hygiene would have long ago been placed in the front rank of elementary science. Geography and history, as these branches are taught in our schools, no doubt fulfill the intention of stocking the memory with useful facts and events without putting a strain on the discursive faculty. Hygiene, which simply embraces a body of physiological facts that stand in relation to the normal functions of the human organism, can be taught with equal facility as a discipline for the youthful mind, and certainly furnishes the memory with materials which, in regard to their uses, leave those of Geography and History far in the rear. It would, moreover, be as interesting to the budding mind of the young learner to have a peep at the anatomy and cunning devices of his system, as to pour over the map of Kamskatka in order to find the names of its rivers. The little pupil would, probably, be as eager to know something of the structure of the teeth which grinds his food that keeps him alive, as to be told of the elephants' tusks and ostrich feathers which the natives on the coast of Africa sell to the traders. With all due deference to the profound interest which attaches to the history of the human family, and the record that informs us of the social and political tendencies that originated customs, laws and institutions, it must nevertheless be admitted that these recondite subjects of research and reflection escape the intellectual grasp of boys and girls. To remember the dates of battles and when they were fought, and to commit to memory the names of kings, emperors and generals, no doubt satisfies a natural curiosity and furnishes a certain sort of information. But be the list of

Digitized by Google

these names ever so great, they do not constitute history; they are not even the landmarks of the historical development of our race, and not even sure as counters of its great epochs. Apart from the fascination which the marvellous structure and arrangements of the animal economy will naturally exert on the inquiring mind, and the admiration which the foresight and wisdom displayed by the working of this wonderful piece of mechanism will inevitably evoke, there is the substantial and practical advantage connected with all this, that the knowledge of the inexorable laws of physiology will convince the young learner of the necessity to conform to the mandates of hygiene if he wishes to preserve life and health. An indirect moral influence cannot be denied to the teachings of hygiene.

It may be reasonably expected that some measure of restraint would result from an acquaintance with the effects inseperable from the violation of physiological laws, for hygiene teaches the capital fact that lasting deterioation of the general health follows in the wake of habits and indulgences that enfeeble and exhaust the nervous system. To gain some insight into the manner by which damage is done to the nervous apparatus alone, suffices to recommend a schooling of the way it can be kept intact. It is the nervous system which not only receives the first brunt of every onslaught that strikes at the integrity of the geneneral constitution, but also, apparently insignificant inroads, in consequence of their cumulative effects, prove disastrous to a delicate and finely adjusted apparatus. It is the nervous system which brings us in relation with the outer world and forms the center of our intellectual and emotional existence. It constantly acts upon all the other organs, and in turn is constantly acted upon by them. There is a sad significance in the consensus of the medical profession, that disorders of the nervous system among people in civilized countries are steadily on the increase, and that the most terrible of all of them, the dethronement of reason, shares in this augmented frequency of occurrence. Historians trace the degeneracy and effeminancy of the Romans, who lived towards the decline of their power in luxurious habits and profligate manners that enervated their wonted vigor and manliness. There are influences at work at present day which tend in an analogous manner to a like result. The wear and tear of body and mind in the hot pursuit of wealth and distinction—the spirit of competition which strains every fibre to its utmost stretch—the heartburnings, the jealousy, the envy and the whole legion of depressing passions which our modern novelists depict with more or less skillful and faithful pens—all these etiological factors must necessarilly produce deleterious consequences. It is of course not the task of hygiene to cast about for prophylactic measures and remedial agencies that might prevent the jarrings of our complex social fabric. It can only note their existence and recognize their bearing on the individual well-being. But it will hardly be denied that our young ones

Digitized by Google

would exceedingly profit by hygienic lessons inculcated on the strength of scientific proof and demonstration, that moderation and self-denial promote health and prolong life, and that the tendencies of vicious habits and corrupt manners lead to degredation and ruin.

This brings me to speak of the source of a widely-spread evil and the cause of untold wretchedness and misery, namely, the excessive use of alcoholic beverages. Concerning the stand taken, or the methods adopted by the advocates of the temperance movement, I am not inclined to touch upon, but it appears to me proper to consider the influence, which an early familiarity with the chemistry of life would exercise in discouraging a habit fraught with dire consequences. Some of the errors of teetotalism will be disclosed by a scientific treatment of the position which alcohol holds as food, and the relation this agent bears to the category of absolute poisons. But it will form a part of hygenic teachings to make it clear that there is never any need of alcohol in the state of health, and that its soothing and exhilirating effects, when habitually sought for, cannot atone for the mischief which they lay in store. Alcohol in disease often supplies a force which is far less rapidly and efficiently obtained by any other therapeutical means for sustaining the vital energy. The pupil will never learn from Lieby that "it can be proved with mathematical certainty, that as much flour or meal as can be laid on the point of a tableknife is more nutritious than ten quarts of beer." And after all, the real curse residing in alcohol is its fatal gift of fascination and potency of effect. These are the causes which justify the bad reputation of alcohol. Were it less alluring it would not lure to excess, and were it less potent it would not be so destructive. Let the teacher of hygenic make his commentaries on this physiological facts and then uncover the hideousness of the charmer.

About ten years ago Prof. E. H. Clark, of Boston, sounded the note of alarm in a little book which he published, that "the delicate, early but rapidly fading beauty, and singular palor of American girls and women have almost passed into a proverb." He heard Lady Amberly say, when she visited the public schools of Boston, that she never before saw so many pretty girls together, and then added, "they all look sick." Mrs. Beecher Stowe writes: "The race of strong, hardy, cheerful girls that used to grow up in the country places and make bright, neat New England kitchens; the girls that could wash, iron, brew, bake, embroider, draw, paint and read innumerable books, the race of woman, pride of olden times, is daily lessening, and, in their stead, come the fragile, easy-fatigued, languied girls of a modern age, drilled in book learning, ignorant of common things." Dr. Wm. Mitchell, of Philadelphia, an eminent observer,, writes in a similar strain, He says: "To-day the American woman is, to speak plainly, unfit for the duties as woman, and is perhaps, of all civilized females, the least qualified to undertake the task which tax so heavily the

Digitized by Google

nervous system of man." Dr. Toner, of Washington, states: "The proportion between the number of American children under fifteen and fifty is steadily declining." In reference to the cause or causes that are said to have brought about this sad state of affairs, there is far less unanimity of agreement. I am inclined to believe that the picture of physical deterioration of American girls and women is much overdrawn. Here, in Baltimore, and I think throughout the State of Maryland, one does not meet with an unusual number of haggard girls and invalid women, though their number would be less if more regard were paid to the avoidance of certain morbid influences that cause nervous exhaustion and impoverish the blood, not the least among the causes which tend to such a depravation of health is the precociousness of the American female. But, independent of this, wise mothers will surely approve of a course of instruction which includes lessons in hygiene.

There was a time when it was universally declared and carried out by the governing and influential classes that the education of the masses should be restricted to reading, writing, cyphering and catechism. We even now occasionally hear them echo this miserable plea for popular ignorance, either for sinister purposes or on grounds absurdly false. I say it advisedly, and with much pride, that there is no civilized country, with the exception of Switzerland, whose public school system can compare in efficiency with those now established in our country. The important question: "What is most worth knowing?" is the problem that the organizers of our popular schools have practically solved, in accordance with the best information they could gather. Improvements in relation to the selection of subjects, and methods of teaching, are adopted when they are recommended for satisfactory reasons. It thus happened that the science of hygiene is now taught in the public schools of some of our sister States. The objections that are raised against the introduction of certain branches of study do not hold in reference to hygiene. The acquirement of the science of hygiene does not imply the acquirement of an accomplishment of no practical value. It is not an instruction for the purpose of a special avocation or profession. On the contrary, no stronger motive can be presented for the acquisition of any piece of knowledge than its intrinsic value and the universal benefit it confers, and this can justly be claimed for that of hygiene. All the possessions and enjoyments that man can rightfully seek after; all the noble aims and pursuits that dignify human nature; the very toil and endurance which the necessities of life impose upon him depend on the conditions of his health. The power of that knowledge which enables him in a great measure to guard against bodily and mental disabilities, is a blessing that cannot be despised.

Digitized by Google

AMERICAN PUBLIC HEALTH ASSOCIATION.

LOMB PRIZE ESSAY.

"*Disinfection and Individual Prophylaxis Against Infectious Diseases.*"

BY GEORGE M. STERNBERG, M. D., *Major and Surgeon U. S. Army.*

Disinfection and Individual Prophylaxis Against Infectious Diseases.

INTRODUCTION.

Definition.—We are met at the outset by a difficulty growing out of the fact that the word *disinfection*, as commonly used, has a very different signification from that to which certain recent authors would restrict it. Thus the Committee on Disinfectants of the American Public Health Association defines a disinfectant as "an agent capable of destroying the infective power of infectious material." (1). In the preliminary report of this committee the reasons for restricting the meaning of the word within the limits justified by its etymology, and of our knowledge of the nature of "infectious material," are very clearly stated, as follows:

"The object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material

(1.) The Medical News, Phila., Jan. 24, 1885, p. 87.)

Digitized by Google

which gives rise to them. This is accomplished by the use of disinfectants."

"There can be no partial disinfection of such material: either its infecting power is destroyed, or it is not. In the latter case there is a failure to disinfect. Nor can there be any disinfection in the absence of infectious material. * * * * *

"Popularly, the term disinfection is used in a much broader sense. Any chemical agents which destroys or masks bad odors, or which arrests putrefactive decomposition, is spoken of as a disinfectant. And in the absence of any infectious disease it is common to speak of disinfecting a foul cess-pool, or a bad smelling stable, or a privy vault.

"This popular use of the term has led to much misapprehension, and the agents which have been found to destroy bad odors —deodorizers, or to arrest putrefactive decomposition—antiseptics —have been confidently recommended and extensively used for the destruction of disease germs in the excreta of patients with cholera, typhoid fever, etc.

"The injurious consequences which are likely to result from such misapprehension and misuse of the word disinfectant will be appreciated when it is known that recent researches have demonstrated that many of the agents which have been useful as deodorizers, or as antiseptics, are entirely without value for the destruction of disease germs.

"This is true, for example, as regards the sulphate of iron or copperas, a salt which has been extensively used with the idea that it is a valuable disinfectant. As a matter of fact, sulphate of iron in saturated solution does not destroy the vitality of disease germs, or the infecting power of material containing them. This salt is, nevertheless, a very valuable antiseptic, and its low price makes it one of the most available agents for the arrest of putrefactive decomposition in privy vaults, etc.

"Antiseptic agents also exercise a restraining influence upon the development of disease germs, and their use during epidemics is to be recommended when masses of organic material in the vicinity of human habitations cannot be completely destroyed, or removed, or disinfected.

"While an antiseptic agent is not necessarily a disinfectant, all disinfectants are antiseptics; for putrefactive decomposition is due to the development of "germs" of the same class as that to which disease germs belong, and the agents which destroy the latter also destroy the bacteria of putrefaction, when brought into contact with them in sufficient quantity, or restrain their development when present in smaller amounts.

"A large number of the proprietary 'disinfectants,' so called, which are in the market, are simply deodorizers or antiseptics of greater or less value, and are entirely untrustworthy for disinfecting purposes." (1)

(1) The Medical News, April 18th, p. 425.

Digitized by Google

The offensive gases given off from decomposing organic material are no doubt injurious to health; and the same is true, even to a greater extent, of the more complex products known as *ptomaines*, which are a product of the vital—physiological—processes attending the growth of the bacteria of putrefaction and allied organism. It is therefore desirable that these products should be destroyed; and, as a matter of fact, they are neutralized by some of the agents which we recognize as disinfectants, in accordance with the strict definition of the term. But they are also neutralized by other agents—deodorants—which cannot be relied upon for disinfecting purposes, and by disinfectants, properly so called, in amounts inadequate for the accomplishment of disinfection. Their formation may also be prevented by the use of *antiseptics*. From our point of view the destruction of sulphuretted hydrogen, of ammonia, or even of the more poisonous ptomaines, in a privy vault, is no more disinfection than is the chemical decomposition of the same substances in a chemist's labratory. The same is true as regards all of the bad smelling and little known products of decomposition. None of these are "infectious material" in the sense in which we use these words; that is, they do not, so far as we know, give rise *directly* to any infectious disease. Indirectly they are concerned in the extension of the epidemic "filth diseases," such as cholera and yellow fever, and of the fatal endemic "filth diseases," such as typhoid fever and diphtheria, which in the long run claim more victims than do the pestilential maladies first named. This because persons exposed to the foul emanations from sewers, privy vaults, and other receptacles of filth, have their vital resisting power lowered by the continued respiration of an atmosphere contaminated with these poisonous gases, and are liable to become the victims of any infectious diseases to which they may be exposed. Moreover, the accumulations of filth which give off these offensive gases furnish pabulum upon which certain disease germs thrive; and it may happen that the bad smelling air carries something worse than the poisonous gas which makes its presence known by the offending sense of smell. It may waft to our nostrils infectious particles which are beyond recognition by any sense, unless it be the sense of sight with the aid of a good microscope.

We desire, moreover, to have it fully understood that in restricting the meaning of the term disinfectant within the limits given by the definition of the Committee on Disinfectants of the American Public Health Association, we do not wish to limit the practice of "disinfection" recognized by many intelligent persons.

Littre, in his Dictionary of the French Language, defines disinfectants as "substances which destroy, chemically, bad odors."

Vallin, the author of the best modern treatise upon "Disinfection and Disinfectants," says:

"From a scientific point of view there is perhaps an impropriety in introducing into the idea of disinfection the suppression of

Digitized by Google

odors which offend the sense of smell. The bad odor in itself is not injurious; it is an epiphenomenon, which does not necessarily give the measure of the hurtful properties of the air, or of any substance whatever. The public, unacquainted with medicine, has an unfortunate tendency to judge of insalubrity by the bad odor; the absence to this gives it a deceitful security; when they are masked by any device it (the public) believes that all danger has been removed. *Nevertheless it is necessary to avoid violating the ordinary sense of words.* An atmosphere which does not in the least offend the sense of smell may certainly be insalubrious, and engender the gravest maladies; but the fetid or disagreeable odors may reveal the presence of injurious principles of toxic gases, or of organic matter in decomposition. We should not too much diminish the importance of these offensive odors in the eyes of the public; every thing which smells badly is to be suspected." (1.)

We agree with Prof. Vallin, that the bad odors should arouse suspicion and lead to the use of deodorants, or of antiseptics, or of disinfectants, if required; but let us not leave the public to suppose that when the bad odors have been neutralized the offensive material has been disinfected. Let us rather instruct the public that to deodorize and to disinfect are not the same thing, and that deodorant and disinfectant are not synonymous terms. For our part we prefer to "violate the ordinary sense" of the word, and to restrict its signification within such limits as will prevent confusion, and, what is far worse, the reliance upon inefficient methods for the destruction of infectious material.

In the present essay we shall use the words disinfection and disinfectant, in accordance with the definition of the committee on disinfectants already given. But, inasmuch as this is intended to be a practical treatise for popular use, we shall also give, in the proper place, directions for the proper use of deodorants and of antiseptics, so that "disinfection" in the broad sense of the word's common usage may be fully considered.

Tests of Disinfection. What means have we of proving that the infective power of infectious material has been destroyed?

Evidence of disinfection may be obtained (a) from the practical experiments—experience—of those engaged in sanitary work; (b) by inoculation experiments upon susceptible animals; (c) by experiments directly upon known disease germs.

(a). It is a matter of common experience that when a room has been occupied by a patient with an infectious disease, such as small-pox, scarlet fever, or diphtheria, susceptible persons are liable to contract the disease weeks or even months after the patient has been removed from it unless in the meantime it has been disinfected. But the non-occurrence of subsequent cases cannot always be taken as evidence that the means of disinfection resorted to were efficient. Negative evidence should be receive

(1) Op. Cit., p. 2.

Digitized by Google

with great caution. In the first place, the question as to whether susceptible individuals have been fairly exposed in the disinfected room must be considered. Then it must be remembered that susceptible persons do not always contract a disease, even when they are exposed in a locality known to be infected. A further difficulty in estimating the value of evidence obtained in practice arises from the fact that, in connection with the special means of disinfection resorted to, such as fumigation, hanging up clothes saturated with a disinfecting solution, etc., it is customary to resort to additional precautionary measures, such as washing surfaces with soap and hot water, white-washing plastered walls, and free ventilation. It is apparent that under these circumstances it would be unsafe to accept the fact that no other cases occurred in a room treated in this way, as evidence that the particular disinfectant used is efficient for the destruction of the infectious agent of the disease in question. The fond mother who attaches a charm to the neck of her child to protect it from evil, also takes the precaution of guarding it from contact with other children who are sick with any infectious disease. If her child fortunately grows to manhood or womanhood without having suffered an attack of scarlet fever or diphtheria, she may imagine that her charm has protected it, but the evidence upon which her faith is founded is not of a nature to convince those who are familiar with scientific methods of demonstration. "Well educated" persons are often ready to testify in favor of methods of disinfection, or of treatment, upon evidence which, from a scientific point of view, has no more value than that which the fond mother in question has to offer in favor of the little bag containing camphor or assafœtida, or some other charm of equal value, which she has attached to her child's neck to keep it from catching scarlet fever or diphtheria at school. On a par with these charms, so far as disinfection is concerned, we may place the saucer of chloride of lime which it was formerly the fashion to place under the bed of a patient sick with an infectious disease, the rag saturated with carbolic acid, or with chloride of zinc, suspended in the sick room, and even the fumigations with burning sulphur, as sometimes practised by those unfamiliar with the evidence as to the exact value of this agent, and the conditions necessary to insure successful disinfection with it.

Chloride of lime, sulphurous acid gas and carbolic acid are among our most useful disinfecting agents, but disease germs are not to be charmed away by them any more than by a little bag of camphor.

Having pointed out the fact that negative evidence, in a restricted field of observation, must be accepted with great caution in estimating the value of disinfectants, we hasten to say that the combined experience of sanitarians, derived from practical efforts to restrict the extension of infectious diseases, is of the greatest value, and that this experience is to a great extent in accord with the results of exact experiments made in the laboratory.

(b). Inoculation experiments upon susceptible animals, made

Digitized by Google

directly with infectious material which has been subjected to the action of a disinfectant, have been made by numerous observers. The proof of disinfection in this case is failure to produce the characteristic symptoms which result from inoculation with similar material not disinfected. Thus Duvaine found that the blood of an animal just dead from the disease known by English writers as anthrax or splenic fever (Fr., charbon), inoculated into a healthy rabbit or guinea pig, in the smallest quantity, infallibly produces death in two or three days; and the blood of these animals will again infect and cause the death of others, and so on indefinitely. This anthrax blood was therefore infectious material, which could be utilized for experiments relating to the comparative value of disinfectants. Duvaine made many such experiments, not only with the blood of anthrax, but also with that of a fatal form of septicæmia in rabbits, which is known by his name. Other investigations have followed up these experiments upon infectious material of the same kind, and also upon material from other sources, *e. g.*, the infectious material of glanders, of tuberculosis, of symptomatic anthrax, of fowl cholera, of swine plague, etc.

It has been proved that the infectious agent in all of the diseases mentioned is a living germ, and that disinfection consists in destroying the vitality of this germ. But in experiments made with blood or other material obtained directly from diseased animals, the results would be just as definite and satisfactory if we were still ignorant as to the exact nature of the infecting agent. The test shows the destruction of infecting power without any reference to the cause of the special virulence, which is demonstrated to be neutralized by certain chemical agents in a given amount. All of the above experiments made with the above-mentioned kinds of virus have been made upon the lower animals; but there is one kind of material which it is justifiable to use upon man himself, and with which numerous experiments of a very satisfactory character have been made. This material is vaccine virus. Fresh vaccine when inoculated into the arm of an unvaccinated person gives rise to a very characteristic result—the vaccine vesicle. The inference seems justified that any agent which will neutralize the specific infecting power of this material will also neutralize the small-pox virus. Thus far it has not been definitely proved that the effective agent in vaccine virus is a living germ; but the numerous experiments made have shown that the chemical agents, which have the power of destroying the various kinds of infectious material heretofore mentioned, have also the power, in about the same amounts, of neutralizing vaccine virus, as shown by its failure to produce any results when inoculated into an unvaccinated person. In these experiments the more careful investigators have taken the precaution of vaccinating the same person with disinfected and non-disinfected virus from the same source. A successful vaccination with the non-disinfected virus shows that the individual is susceptible and the material good; failure to produce any result is evidence that the potency of the

Digitized by Google

disinfected virus has been destroyed by the chemical agent to which it was exposed.

(c). As already stated, it has been demonstrated that the infectious diseases of the lower animals, which have furnished the material for the experiments upon the disinfectants by the method of inoculation, are "germ diseases," and that the infectious agent is in each case a living micro-organism, belonging to the class known under the general name of *Bacteria*. The bacteria are vegetable organisms, which by reason of their minute size and simple organization, must be placed at the very foot of the scale of living things. But they make up in number and in rapidity of development for their minute size; and there is good reason for believing that the infectious diseases of man are also caused by pathogenic disease-producing organism of the same class. Indeed, this has already been proved for some of these diseases and the evidence as regards several others is so convincing as to leave very little room for doubt.

Many of these disease germs are now known to us, not only by microscopic examination of the blood and tissues of infected animals, but also by "culture experiments." That is, we are able to cultivate them artificially in a suitable media, and to study their mode of development, etc., in the labratory, quite independently of the animals from which our "pure cultures" were obtained in the first instance. The culture fluids used are prepared from the flesh of various animals; and when to one of these a certain quantity of gelatine is added, we have a "solid culture" medium, upon the surface of which some of these germs will grow most luxuriantly. To start such a "culture" it is only necessary to transfer, with proper precautions, a minute quantity of the infectious material to the surface of our culture medium, or into a fluid which has been found to be suitable for the growth of the particular organism which we desire to cultivate. A second culture is in the same way started from the first, and so on indefinitely.

Now it is evident that these "pure cultures" furnish us a ready means for testing the power of various chemical agents to destroy the vitality of known disease germs, as shown by their failure to grow in a suitable culture medium after exposure for a given time to a given percentage of the disinfectant. Very many experiments of this nature have been made during the past three or four years. The reader who desires fuller details as to the method of conducting such experiments, and of the results obtained, is referred to the preliminary reports of the committee on disinfectants, of the American Public Health Association, published during the current year (1885) in the *Medical News*, Philadelphia, and which will, doubtless, also be published in full in the next annual volume of the association. We may say here, that the experimental data on record indicate that those agents which are efficient for the destruction of any one of the pathogenic organisms upon which experiments have been made, or of the harm-

Digitized by Google

less species of the same class, e. g., the bacteria of putrefaction, are efficient for the destruction of all, *in the absence of spores*. There is, it is true, within certain limits, a difference in the resisting power of different organisms of this class to chemical agents. This is not, however, sufficiently marked to prevent the general statement that a *disinfectant for one is a disinfectant for all, in the absence of spores*.

The last clause of the above statement calls for an explanation, and certain details with reference to the mode of reproduction of disease germs. All of the bacteria multiply by binary division; that is, one individual divides into two, and each member of the pair again into two, and so on. The spherical bacteria, known as *micrococci*, multiply only in this way, but the rod-shaped bacteria, or *bacilli*, also form spores. These spores correspond with the seeds of higher plants. They are highly refractive, oval or spherical bodies, which, under certain circumstances, make their appearance in the interior of the rods, which cease to multiply by binary division when spore formation has taken place. The point of special interest with reference to these spores is, that they have a resisting power to heat, and to the action of chemical disinfectants, far beyond that which is possessed by *micrococci*, or by bacilla without spores. The difference may be compared to the difference between a tender plant and its seeds to deleterous influences, such as extremes of heat and cold. Thus the spores of certain species of bacilla withstand a boiling temperature for several hours, while a temperature of 150 deg. Fahr. quickly kills most bacteria in the absence of spores. A similar difference is shown as regards the action of chemical agents. Certain agents,—e. g., sulphurous acid gas and carbolic acid,—which are extensively used as disinfectants, have been proved by exact experiments to be quite impotent for the destruction of spores. This being the case, it is advisable, in practical disinfection, always to use an agent which has the power of destroying spores, in those cases in which the exact nature of the disease germ has not been demonstrated. The cholera germ of Koch does not form spores; and there is good reason to believe that the same is true as regards the germs of yellow-fever, of scarlet fever, and of small pox, which have not yet been demonstrated. This inference is based upon evidence obtained in the practical use of disinfectants, and upon certain facts relating to the propogation of these diseases.

A second general statement, which is justified by the experimental evidence on record, is that *agents which kill bacteria in a certain amount, prevent their multiplication in culture fluids, when present in quantities considerable less than are required to completely destroy vitality*.

An agent, therefore, which, in a certain proportion and in a given time, acts as a "germicide" in a smaller quantity, may act as an antiseptic, i. e, may prevent putrefactive decomposition by restraining the development of the bacteria of putrefaction. Antiseptics also prevent or retard the development of pathogenic

Digitized by Google

bacteria. It follows from this that germicides are also antiseptics; but the reverse of this proposition is not true as a general statement, for all antiseptics are not germicides. Thus alcohol, common salt, sulphate of iron, and many other substances which are extensively used as antiseptics, have scarce any germicide power, even in concentrated solutions, and consequently would be entirely unreliable as disinfectants.

Practically, antiseptics may accomplish the some result in the long run as we obtain in a short time by the use of disinfectants. If, for example, we prevent the development of the germs of cholera, or of typhoid fever, in an infected privy vault, by the continued use of antiseptics these germs will in time lose their ability to grow, when introduced into a suitable culture medium. But in the meantime there is always the possibility that some of them may escape, with the fluid contents of the vault, into the surrounding soil, and contaminate some well or stream from which drinking water is obtained. For this reason privy vaults, cesspools and sewers should never be allowed to become infected. All infectious material, such as the dejections of patients with cholera or typhoid fever, should be destroyed at its source, in the sick-room; or, if it is ascertained that such material has been thrown into a privy vault, the entire contents of the vault should be promptly disinfected. The same rule applies to infectious material thrown upon the ground, or wherever it may be.

Finally, we desire to emphasize the following propositions:

Disinfection consists in distinguishing the spark, killing the germ, which may light up an epidemic in the presence of a supply of cumbustible material—filth.

The object of *general sanitary police* is to remove this combustible material out of the way, so that no harm may result even if the spark be introduced.

Antiseptics and deodorants are useful when it is impracticable to remove offensive organic material from the vicinity of human habitations, but they are a poor substitute for cleanliness.

PART FIRST.

DISINFECTION.

It will be our aim in the present chapter to give reliable, practical directions with reference to the use of disifectants, and the best methods of disinfection. Keeping this object in view we shall recommend for disinfecting purposes only those agents named in the following list:

Group 1.

Disinfectants which have the power of destroying spores:

1. Fire.
2. Steam under pressure (25 lbs.).

Digitized by Google

3. Boiling water.
4. Chloride of lime (in solution).
5. Liquor soda chlorinatae.
6. Mercuric chloride (in solulion).

Group 2.

Disinfectants which are effective in the absence of spores:

7. Drv heat (230 deg. Fahr. for two hours).
8. Sulphur dioxide.
9. Carbolic acid.
10. Sulphate of copper (in solution.)
11. Chloride of zinc (in solution.)

Note.—In the present state of knowledge, a division of disinfecting agents into two groups becomes necessary, unless we would entirely dispense with the use of those agents named in our second group, which cannot be relied upon for the destruction of spores and consequently cannot be recommended for the destruction of all kinds of infectious material. As this group includes several agents which are extensively used for disinfecting purposes, and which we believe to possess great practical value, we have considered it necessary to make this distinction. The present state of science, however, does not enable us to classify all infectious diseases in the same way, and in case of doubt it will always be advisable to use those agents included in group first. But in the absence of a precise knowledge of the nature of the germ, we may in certain cases be governed by the practical experience of sanitarians, and by experiments which have been made directly upon infectious material, e. g., on vaccine virus. In our recommendation we have taken account of this kind of evidence, as well as of labratorial experiments, in which known disease germs or harmless organisms of the same class have served as the test of disinfectant power.

We shall first give a brief account of the conditions of successful disinfection with these agents, as established by experimental data, and afterwards detail directions for their employment under the various circumstances in which disinfection is required.

1. *Fire.*—It is hardly necessary that burning of infectious material, infected clothing, etc., is an effectual method of disposing of it. This method of disinfection is always to be recommended, when practicable or consistent with a due regard for economy and the rights of individuals. As a rule, articles of little value, which have been soiled with infectious material, had better be burned; and this is especially true of old clothing and bedding. But we have other efficient methods of disinfection, which make it unnecessary to sacrifice articles of value except under unusual circumstances.

2. *Steam Under Pressure.*—The disinfecting power of steam given off from boiling water in an open vessel does not differ from that of the water itself, but confined steam has a temperature cor-

Digitized by Google

responding with the pressure as indicated by a steam guage. At 20 lbs. pressure the temperature is about 230 deg. Fahr. (105 deg. C.); at 25 lbs. it is about 240 deg. Fahr; at 30 lbs. it is 250 deg. Fahr. Moist heat at the lowest temperature named destroys the moist resistant spores in twenty minutes; with a temperature of 240 deg. Fahr. it is effective almost immediately. (1).

3. *Boiling.*—In the absence of spores, bacteria are quickly killed at a temperature considerably below the boiling point of water, and it is safe to say that boiling for half an hour will destroy all known disease germs, including the spores of anthrax, which have less resisting power than the spores of certain harmless and widely distributed bacilli, which have been found to resist boiling for several hours.

4. *Chloride of Lime*—(Chlorinated lime, bleaching powder).—This is one of the cheapest and most efficient of disinfectants. It should be packed in air-tight and moisture-proof receptacles, —glass is preferrable,—and should contain at least 25 per cent. of available chlorine. (2) It should be used in solution, which had better be made as required. An insoluble residue will be left which may be removed by filtration or decantation. This, however, is not at all necessary. Chlorinated lime owes its disinfecting power to the presence of the hypo-chlorite of lime, a salt which is freely soluble in water, and which is quickly decomposed by contact with organic matter. Germs of all kinds, including the most resistant spores, are destroyed by this solution, but it must be remembered that the disinfectant itself is quickly decomposed and destroyed by contact with organic matter, and that if this is present in excess, disinfection may not be accomplished, especially when the germs are imbedded in masses of material which are left after the hypo-chlorite of lime has all been exhausted in this solution.

5. *Liquor sodæ chlorinatae* (Larbarraque's solution).

This is a solution of hypo chlorite of soda. Its value as a disinfectant corresponds with that of solutions of the hypo-chlorite of lime of the same strength. The preparations in the market vary greatly in value, and some of those tested by the committee on disinfectants (3) were found to be practically without value. This is due to the fact that the solution does not keep well. For this reason, and on the score of economy, a solution of chloride of lime will be preferable for most purposes. Labarraque's solution is, however, a more pleasant preparation for bathing the surface of the body, and both as a deodorant and a disinfectant will be found useful in the sick room. It should contain at least three per cent. of available chlorine.

6. *Mercuric Chloride* (bichloride of mercury, corrosive sublimate). This salt is well known as a deadly poison, which has

(1). See preliminary report of committee on disinfectants in the *Medical News*, Philadelphia, Mar. 14, 1885, p. 284.

(2). The test for available chlorine is given in preliminary report No. 11 of the Committee on Disinfectants, l. c., Jan. 7, p. 148.

(3) l. c. p. 669.

Digitized by Google

long been used in domestic practice as a "bug poison." Recent researches show that it has germacide powers of the first order, and it is consequently a disinfectant which may be recommended for certain purposes, due regard being had to its poisonous nature, and to the fact that it is decomposed by contact with lead, tin, or copper, and that lead pipes are soon rendered brittle and worthless by passing through them solutions of mercuric chloride. Its potency in dilute solutions (1:500 to 1:4000) makes it comparatively cheap (1), and the danger of accidental poisoning from such dilute solutions is not very great. The concentrated solutions should be colored as a precaution against accident, for they have neither color nor odor to reveal their deadly nature.

A standard solution which contains four ounces to the gallon of water is of convenient strength for a concentrated solution, to be issued by manufacturers or health authorities in properly labelled bottles. This may be colored with permanganate of potash (2), or with indigo, or with aniline blue. Inasmuch as standard solution number two of the committee on disinfectants is colored with a permanganate, it would perhaps be better to give this solution a blue color. The writer would suggest the following formula, in which another poisonous metallic salt contained in our list is combined with the mercuric chloride:

Bichloride of mercury	4 ounces.
Sulphate of copper	1 pound.
Water	1 gallon.

It must be remembered, in using this and other disinfecting solutions, that the condition relating to time of exposure to the action of the disinfecting agent is an important one. The experimental evidence (3) relating to the germacide power of mercuric chloride shows that the time of exposure being two hours, this salt may be safely recommended for the destruction of spore-containing infectious material in the proportion of 1 : 1000, and of pathogenic organism in the absence of spores in the proportion of 1 : 4000, or even less, *provided that the micro-organism to be destroyed are fairly exposed to its action.* The fact that the mercuric chloride combines with and coagulates albuminous material interferes to some extent with its value as a disinfectant, and will be kept in view in the recommendations to be made hereafter relating to the practical use of this agent. Mercuric chloride is an efficient antiseptic in the proportion of 1 : 15000, and it exercises a restraining influence upon the development of the spores of the anthrax bacillus, when present in culture solutions, in the proportion of 1 : 300,000, and even less.

Dry Heat.—Dry heat is only to be recommended for the disinfection of such articles as would be injured by exposure, or to a disinfecting solution. A properly constructed disinfection cham-

(1). It costs about 50 cents per pound by the quantity.
(2). Ten grains to the gallon is sufficient.
(3). *The Medical News*, Feb. 21, p. 205.

Digitized by Google

ber or "oven" is absolutely essential, if dry heat is to be used. The experimental evidence on record (1) shows that the destruction of spores requires a temperature which would injure woolen fabrics (140 deg. C. for three hours). In the absence of spores, however, articles which are freely exposed for two hours to a temperature of 110 deg. C. (230 deg. Fahr.) may with safety be considered disinfected. In practice it will be necessary to remember that the penetrating power of dry heat is very slight, and that packages, bundles, or even articles loosely thrown one upon another, cannot be disinfected in this way.

8.—*Sulphur dioxide* (sulphurous acid gas). Fumigation with buring sulphur has long been a favorite method of disinfection. The experience of sanitarians is in favor of its use in yellow fever, small-pox, scarlet fever, diptheria, and other diseases in which there is reason to believe that the infectious material does not contain spores. The experimental evidence on record (2) shows that under certain conditions it is effective for the destruction of micro-organisms in the absence of spores, but that it is quite impotent for the destruction of these reproductive elements.

The presence of moisture adds greatly to the disinfecting power of this agent. It is freely soluble in water, one volume dissolving fifty volumes of the gas. It is therefore evident that a saturated aqueous solution is fifty times as strong as the pure gas—anhydrous. In acqueous solution, in the proportion of 1:2000 by weight, sulphur dioxide kills micrococci in two hours' time. (3) In a gas-tight receptacle it destroys the infecting power of vaccine virus dried upon ivory points, when present in the proportion of one volume per cent., the time of exposure being six hours. (4) The same proportion destroys anthrax bacilli, without spores, from the spleen of an animal recently dead, dried upon silk threads, in thirty minutes (Koch). These facts show that sulphur dioxide is a valuable disinfectant; but the conditions of successful disinfection, as established by the experimental evidence, are, that the material to be disinfected shall be freely exposed to its action for a considerable time, *in a receptacle which does not permit the gas to escape.* It must be remembered that disinfection of a thin layer of vaccine virus upon an ivory point, or of anthrax blood upon a silk thread, exposed in a gas-tight receptacle, cannot be taken as evidence that thicker layers of infectious material, attached to the surface of clothing and bedding, or enclosed in folded blankets, bundles of clothing, mattresses, etc., can be disinfected by the same amount of sulphur dioxide generated in a room which is not gas-tight. It has been shown, by carefully conducted experiments (5) that the escape of sulphurous acid gas from a bed chamber or hospital

(1) See *Medical News*, March 11, p. 283.
(2) See Prelim. Rep. No. VII, the *Medical News*, March 28, p. 243.
(3) l. c., p. 348.
(4) l. c., p. 344.
(5) l. c., p. 347.

Digitized by Google

ward is very rapid, in spite of the usual precautions for stopping up crevices when such room is to be fumigated; the infectious material, enclosed in bundles or protected by folds of blankets, etc., may escape disinfection, after having been exposed for many hours in a tightly closed chamber containing ten volumes per cent. of this gas.

9. *Carbolic Acid.*—The disinfecting power of carbolic acid has been fixed by experiments upon vaccine virus, and upon various pathogenic organisms. A saturated aqueous solution cannot, however, be relied upon for the destruction of spores; but in the absence of spores it is fatal to micro-organisms in the proportion of two per cent., the time of exposure being two hours. Indeed, less than one per cent. is fatal to several of the species of pathogenic micrococci which have served as test organism in the numerous experiments which have been made with this agent. (1). Upon the recommendation of the famous Dr. Koch, the discoverer of the cholera bacillus, the Committee on Disinfectants, of the International Sanitary Conference of Rome, (1885), has given this agent the first place for disinfected soiled clothing, excreta, etc., in cholera. For excreta it is to be used in five per cent. solution, and for clothing, etc., in two per cent. solution. The experimental evidence upon record indicates that it may be relied upon in this proportion.

10. *Sulphate of Copper.*—This salt has been largely used as a disinfectant in France, and recent experiments show that in the proportion of one per cent. it is a reliable agent for the destruction of micro-organisms in the absence of spores. It is much below mercuric chloride in germacide power, but is a better deodorant—not a better antiseptic—than the more poisonous salt. When we take into account its efficiency, it is comparatively cheap, and is to be recommended for certain purposes. It may be combined with the more potent germacide, mercuric chloride, in accordance with the formula already given.

11. *Chloride of Zinc.*—Solutions of chloride of zinc are largely used in this country and in Europe for disinfecting purposes. It is an excellent antiseptic and deodorant, and its power to destroy disease germs has been very much over-estimated. It may, however, be relied upon for the destruction of pathogenic organisms, in the absence of spores, in solutions which contain from five to ten per cent. of the salt.

GENERAL DIRECTIONS FOR DISINFECTION.

"In the sick room we have disease germs at an advantage, for we know where to find them, as well as how to kill them. Having this knowledge, not to apply it would be criminal negligence, for our efforts to restrict the extension of infectious diseases must depend largely upon the proper use of disinfectants in the sick room." (2).

(1). Prelim. Rep. of Com. on Disinfectants, No. VI., l. c., p. 317,
(2). Prelim. Rep. of Com. on Disinfectants, of A. P. H. A.

Digitized by Google

Disinfection of Excreta, Etc.—The dejections of patients suffering from an infectious disease should be disinfected before they are thrown into a water closet or privy vault. This is especially important in cholera, typhoid fever, yellow fever, and other diseases in which there is evidence that the infectious agent is capable of self-multiplication, in suitable pabulum, external to the human body. Vomited matters, and the sputa of patients, with these and other infectious diseases, should also be promptly disinfected. This is especially important in cholera, diphtheria, scarlet fever, whooping cough, and tuberculosis. It seems advisable also, to treat the urine of patients sick with an infectious disease with a disinfecting solution.

For the disinfection of excreta, etc., in the sick room, a solution of chloride of lime is to be recommended. This is an excellent and prompt feodorant as well as a disinfectant. A quart of the standard solution (No. 1), recommended by the committee on disinfectants of the American Public Health Association, will suffice for an ordinary liquid discharge in cholera or typhoid fever; but for a copious discharge it will be prudent to use twice this quantity, and for solid fecal matter a stronger solution will be required. As chloride of lime is quite cheap, it will be the best to keep on the safe side, and to make the solution for the disinfection of excreta by dissolving eight ounces of chloride of lime in a gallon of water. This solution should be placed in the vessel before it receives the discharge. The material to be disinfected should be well mixed with the disinfecting solution by agitating the vessel, and from thirty minutes to an hour should be allowed for the action of the disinfectant, before the contents are thrown into a water closet or privy-vault.

Standard Solution No. 2, of the committee on disinfectants, which contains two drachms of corresive sublimate and two drachms of perman-ganate of potash to the gallon of water, if freely used, one quart for each dejection, and left in contact with the material to be disinfected for at least four hours, is a reliable disinfectant for *liquid discharges*. The caution with reference to lead pipes must be remembered, and if this solution is used in the sick room or in hospital wards, it will be desirable to have receptacles of wood or earthen-ware for the disinfeced material, which may be carried away and emptied in a suitable locality once in twenty-four hours.

The blue solution heretofore suggested would also be suitable for use in the same way, and with the same precautions. It contains four ounces of corrosive sublimate aud a pound of sulphate of copper to the gallon of water. This concentrated solution should be diluted in the proportion of eight ounces to the gallon of water, and the diluted solution used as heretofore recommended, at least a quart for each dejection, and four hours' time. The disinfecting power of the copper salt adds to the value of this solution, and the bright blue color of the concentrated solution

Digitized by Google

leaves nothing to be desired in the way of a color protection against accidental poisoning.

For the disinfection of the discharges of cholera patients, a five percent. solution of carbolic acid may be used, in accordance with the recommendation of the International Sanitary Conference of Rome. The time necessary to insure disinfection is fixed at four hours.

Chloride of zinc in ten percent. solution may be used for the dejections of cholera patients, the same conditions being observed in regard to quantity and time of exposure as were fixed for the other metallic salts named.

It will be best to burn cloths used in wiping away the discharges of the sick, and especially those used in wiping away the infectious material from the mouth and nostrils of patients with diphtheria or scarlet fever. Bits of old muslin may be used for this purpose, and at once be thrown upon an open fire or gas stove arranged in the fire place for this purpose.

Infected sputum may be discharged directly into a cup half full of the solution of choloride of lime recommended for excreta, or of Labarraque's solution.

Handkerchiefs, napkins and towels used in wiping away infectious discharges, if worth preserving, should be at once immersed in one of the following solutions: Chloride of lime 2 percent.; carbolic acid 2 percent.; mercuric chloride 0.1 percent. (=1:1,000).

The blue solution (containing sulphate of copper), diluted in the proportion of four ounces to the gallon of water, may also be used for this purpose. Cloths used for washing the general surface of the body should also be disinfected with one of the above mentioned solutious; and attendants should invariably disinfect their hands by washing them in one of these solutions, when they have been soiled by the discharges of the sick.

Disinfection of the Person.—Labarraque's solution, diluted with twenty parts of water, is a suitable disinfecting solution for bathing the entire surface of the body of the sick, of convalescents, or of those whose duties take them into the sick room; or of a one per cent. solution of chloride of lime, or a two per cent. solution of carbolic acid, may be used.

The International Sanitary Conference of Rome gives the following directions with reference to the disinfection of the body after death from cholera:

"The body should be enveloped in a sheet saturated with one of the strong disinfection solutions, (1) without previous washing, and should at once be placed in a coffin."

We see no objection to washing the body, if the strong solution of chloride of lime is used for this purpose. Washing with water would necessitate the careful disinfection of the water and cloths used for this purpose, and of the hands of the attendants. As the odor of chlorine or carbolic acid would be objectionable under the

(1) Chloride of lime 4 per cent., or carbolic acid 5 per cent.

Digitized by Google

circumstances, we see no good reason for insisting upon the use of these agents, rather than on the odorless solution of mercuric chloride, which in the proportion of 1 : 1000, would no doubt be equally effective. But when there is an odor of decomposition to be neutralized, the solution of chloride of lime will have a decided advantage on account of its deodorizing properties.

Disinfection of Clothing and Bedding.—The cheapest and best way of disinfecting clothing and bedding, which is not injured by the ordinary operations of the laundry, is to immerse it in boiling water for a half an hour or longer. It should be placed in boiling water as soon as removed from the person, or the bed of the sick, and if it is necessary to remove the articles from the room in order to accomplish this, they may be wrapped in a sheet or towel thoroughly saturated with a disinfecting solution. If it is impractable to disinfect such infected clothing and bedding *immediately* by boiling, it will be necessary to immerse it in one of the following disinfecting solutions, in which it should be left for four hours :

Mercuric chloride, 1 : 2000; or the "blue solution" of this salt and sulphate of copper, diluted by adding two fluid ounces of the concentrated solution to a gallon of water; or a two per cent. solution of carbolic acid. The solution of chlorinated lime (two per cent.) may also be used, but we give the precedence to the first mentioned solutions because of the bleaching properties of this solution. The blue solution does not injure clothing, and is to be preferred for domestic use to a simple solution of corrosive sublimate, which in the concentrated form is highly poisonous, and without odor or color. When diluted as directed, this solution may, however, be used without danger either from absorption through the hands, or by drinking. The metallic taste of the diluted solution could scarcely fail to prevent a dose from being swallowed accidentally.

For outer clothing and other articles which would be seriously injured by immersion in boiling water, the best disinfectant is *steam.* Exposure to steam at 100 deg. C. (212 deg. Fahr.) for half an hour would be equivalent to exposure in boiling water for the same time, if the clothing is hung up in such a manner as to be fairly brought under the action of the disinfecting agent. To be certain that the steam does not fall below this temperature in the disinfection chamber, a thermometer must be placed in one corner of the room, at a distance from the point of entrance of the steam, or in an aperture from which the steam escapes. This should mark at least 100 deg. C. for half an hour before the disinfection can be considered complete. (1) To accomplish this, it is evident that the steam must come from the generator at a higher temperature, or, in other words, must be under pressure.

It must be remembered that the destruction of spores is the most difficult test of disinfecting power known, and one which

(1) The Comm. on Disinfectants of the Int. San. Conf. of Rome fixes one hour as the time during which steam should be made to pass over the articles to be disinfected.

Digitized by Google

excludes the use of carbolic acid, sulphur dioxide, and other agents which enjoy the confidence of sanitarians, and which have been proven by laboratory experiments to destroy pathogenic organisms in the absence of spores. There is good reason for the belief that *dry heat* and *sulphurous acid gas* may be safely substituted for steam for the disinfection of the clothing of patients with cholera, yellow fever, and small pox, and probably in several other infectious diseases [puerperal fever, erysipelas, diptheria [?], and scarlet fever [?].

As disinfection by steam will injure certain articles, *dry heat* may be used as a substitute for moist heat, but in this case a temperature of at least 110 degrees C. (230 Fahr.) maintained for two hours will be required. In the use of dry heat even greater care is necessary that the articles to be disinfected are freely exposed, that is, not placed in the oven in bundles, or piled one upon another, but freely suspended in the disinfecting chamber. For it has been shown by carefully conducted experiments that the penetrating power of dry heat is very slight. A properly conducted disinfection, oven such as that of Ransom (1), will be required if dry heat is to be used.

As the appliances for disinfecting with steam or with dry heat are somewhat expensive, these agents are not likely to supplant, for general use, the time-honored practice of fumigation with sulphurous acid gas. This method of disinfection commends itself because of the cheapness of the material used and the facility of its application. Sulphur dioxide is a less reliable disinfectant than steam or dry heat, but when the necessary conditions are observed there is no doubt of its utility; and the fact that it does not kill the spores of anthrax and of other bacilli is no reason for rejecting an agent which has been demonstrated by experience to be one of great value, which has been proved by laboratory experiments to be fatal to pathogenic organisms in the absence of spores, and to destroy the infecting power of vaccine virus. Bnt in using this agent the conditions of successful disinfection, which have been established by experiment, should be borne in mind. The room which is to serve as a disinfecting chamber must be very thoroughly closed; every crevice and key-hole should be carefully stopped with cotton or by fastening paper over it. Even this precaution will not prevent the rapid escape of gas from cracks around doors, windows, etc. It is, therefore, desirable when practicable to use a disinfecting chamber which can be hermetically closed. The atticles to be disinfected must be very freely exposed, and should never be thrown into the room in bundles or piled one upon another. We concur in the recommendation of the committee on disinfectants of the American Public Health Association as to the amount of sulphur which should be burned and the method of effecting its complete combustion:

"To secure any result of value it will be necessary to close the

(1). *British Medical Journal*, Sept. 6, 1873. p. 274.

Digitized by Google

apartment to be disinfected as completely as possible, by stopping all apertures through which gas might escape, and to burn at least three pounds of sulphur for each thousand cubic feet of air space in the room. To secure complete combustion of the sulphur it should be placed, in powder or in small fragments, in a shallow iron pan, which should be set upon a couple of bricks in a tub partly filled with water to guard against fire. The sulphur should be thoroughly moistened with alcohol before igniting it."(1)

Finally we would remark that in the absence of suitable appliances for disinfection, and generally when the articles infected are of little value, consumption by fire furnishes the readiest and safest method of disposing of such articles.

For articles of value, such as upholstered furniture, etc., which would be injured by any of the processes heretofore recommended, free exposure to the air (æration) for three or four weeks is directed by the committee on disinfectants of the International Sanitary Committee of Rome. The same committee directs that "objects made of leather, such as trunks, boots, etc., should be destroyed, or washed several times with the weak disinfection solutions"—carbolic acid, 2 per cent., or chloride of lime, 1 per cent.

The means heretofore recommended for the disinfection of woolen clothing, blankets and similar articles will not be sufficient for soiled mattresses. As a rule they should be opened and the contents disinfected by steam or dry heat, with subsequent free æration, and the cover should be washed in boiling water after treatment with a disinfecting solution.

Disinfection of the Sick Room.—Every effort should be made to prevent a room occupied by patients sick with an infectious disease from becoming infected. Carpets, stuffed furniture, curtains and other articles difficult to disinfect should be removed at the outset. Indeed, nothing should be left in the room which is not absolutely required, and all furniture and utensils should be of such a character that they can be readily disinfected by washing with boiling water or with a disinfecting solution. Abundant ventilation and scrupulous cleanliness should be maintained, and a disinfecting solution should always be at hand for washing the floor, or articles in use, the moment they are soiled by infectious discharges. For this purpose a solution of chloride of lime may be used (4 per cent.)

It is impracticable to destroy infectious material in an *occupied* apartment by means of gases or volatile disinfectants, for to be effective these must be used in a degree of concentration which would make the atmosphere of a room quite irrespirable. These agents are therefore useful only as deodorants. They are all more or less offensive to the sick, and will seldom be required, even as deodorants, when proper attention is paid to cleanliness and ventilation.

(1). Preliminary report, l. c., p. 427.

Digitized by Google

Daily wiping of all surfaces, floors, walls and furniture with a cloth wet with a disinfecting solution is to be recommended. For this purpose a solution of chloride of lime, 2 per cent., or of carbolic acid, 2 per cent., or of mercuric chloride, 1 : 2000, may be used.

By such precautions as have been indicated, the infection of the sickroom may be prevented, especially in those diseases, such as cholera and typhoid fever, in which the infectious agent is not given off in the breath, or from the general surface of the body of the sick person. In small pox and scarlet fever there is greater danger that the infectious agent may remain attached to surfaces in the room, for the atmosphere becomes infected with particles given off from the surface of the patient's body.

As already stated, the atmosphere cannot be disinfected while the room is occupied. There is much less reason for disinfecting it when the patient has been removed, and it is much simpler to renew it by throwing open the doors and windows than to attempt to disinfect it. Indeed, there will be no infectious particles to destroy, except such as are dislodged from surfaces, window-ledges, etc., where they have settled as dust while the room was occupied; and it the precautions above recommended have been taken, the danger of such reinfection of the atmosphere will be reduced to a minimum.

Disinfection of the vacated room, then, consists in the destruction of all infectious particles which remain attached to surfaces, or lodged in crevices, in interstices of texible fabrics, etc. The object in view may be accomplished by thoroughly washing with one of the disinfecting solutions heretofore recommended; but most sanitarians think it advisable, first, to fumigate the room with sulphur dioxide. This practice is to be recommened, and the directions given by the Committee on Disinfectants, already quoted, should be followed (3 lbs. of sulphur to 1,000 cubic feet of air space.) At the end of from twelve to twenty-four hours, doors and windows should be opened and the room freely ventilated. After this fumigation, all surfaces should be washed with a disinfecting solution (chloride of lime, 2 per cent.; carbolic acid, 2 per cent.; or mercuric chloride, 1:1000), and afterwards thoroughly scrubbed with soap and hot water. Plastered walls should be whitewashed. The fumigation recommended is especially important in the case of rooms, the walls of which are covered with paper, and in rooms from which curtains, carpets, etc., have not been removed; and under these circumstances, as a rule, it will be advisable to repeat the fumigation on a second or even a third time. The process is inexpensive, and the old saying that "whatever is worth doing at all is worth doing well," applies with especial force to the use of disinfectants. Excessive precaution can do no harm, but the inefficient use of disinfecting agents, which results from indifference, or from ignorance of the precis value of the agents relied upon, may be disastrous.

Disinfection of Privy Vaults, Cesspools, Etc.—The contents of privy vaults and cesspools should never be allowed to become of-

Digitized by Google

fensive or to accumulate unduly. By frequent removal, and by the liberal use of antiseptics, such necessary receptacles of filth should be kept in sanitary condition. The absorbent deodorants, such as dry earth or pounded charcoal—or the chemical deodorants and antiseptics, such as chloride of zinc, sulphate of iron, etc.—will, under ordinary circumstances, prevent such places from becoming offensive. Disinfection will only be required when it is known, or suspected, that infectious material, such as the dejections of patients with cholera, yellow fever, or typhoid fever, has been thrown into the receptacles, which are especially dangerous, because they contain pabulum suitable for the development of the germs of these diseases. Mercuric chloride commends itself especially for the disinfection of such masses of material, because, even if any germs escape immediate destruction, they will fail to multiply in the presence of this potent antiseptic. The chloride of lime solution, on the contrary, is preferable for use in the sickroom, because of the promptness and certainty of its germacide action and its deodorizing power. But it has the disadvantage, where large masses of material are to be disinfected, that it is itself destroyed by contact with organic matter; and that if there is a surplus of infectious material after the disinfecting solution has been neutralized, this will be as potent for mischief as a larger quantity would have been.

Mercuric chloride should be used in *solution*, in the proportion of "one pound for every five hundred pounds—estimated—of fecal matter contained in the vault. [1]. All exposed portions of the vault and the wood work above it, should be thoroughly washed down with the disinfecting solution." [2].

The subsequent daily use of a smaller quantity of the same solution would ensure the continued disinfection of fresh material thrown into the vault. Or chloride of lime in powder may be freely scattered over the contents after the first disinfection with mercuric chloride. A diluted powder, made by mixing one pound of chloride of lime with nine pounds of plaster of Paris, or of clean, well dried sand, may be used for this purpose. This is more easily spread about, can be used more economically, and is sufficiently strong in chlorine for practical purposes. As chloride of lime is an excellent deodorant as well as a disinfectant, such a powder commends itself for general use in open privy vaults and cesspools, not only during the prevalence of epidemics, but at all times when they gave evidence of being in an unsanitary condition.

Hospitals.—The directions already given in regard to dicinfection of the sick room and its contents apply as well to hospital wards in which patients with infectious diseases are treated. In addition to this, it will be necessary in hospitals to guard against

(1). Recent experiments made by the writer make it apparent that the complete sterilization of large masses of fecal matter in privy vaults would be a difficult and expen-ive undertaking, if not entirely impracticable. It is therefore of prime importance that infectious material should be destroyed before it is thown into a receptacle of this kind.

(2), Prelim.Rep. of Com. on Disinfectants, 1 c.

Digitized by Google

such infectious diseases as erysipelas, septicaemia, puerperal fever, and hospital gangrene. The antiseptic treatment of wounds, in connection with a proper regard for cleanliness and ventilation, has practically banished these diseases from well regulated hospitals. Of the first importance in effecting this are the precautions now taken with reference to the disinfection of sponges, instruments, the hands of attendants, etc.

Instruments of silver, such as probes and catheters, may be disinfected by passing them through the lame of an alcohol lamp. Instruments of steel, gum catheters, etc., may be disinfected by immersion in a five per cent. solution of carbolic acid, or in a 1 : 1000 solution of mercuric chloride. For instruments and vessels of copper, brass and tin, boiling water, or the carbolic acid solution, may be used. Vessels of porcelain or glass may be disinfected by heat, or by either of the disinfecting solutions mentioned. Sponges should be kept permanently in one of the disinfecting solutions, or, what is better, may be dispensed with entirely for the cleansing of wounds. In place of them, irrigation with a disinfecting solution may be resorted to, or the discharges may be wiped away with some cheap absorbant material which can be burned after having been once used.

Patients in hospitals, with infectious diseases, will of course be kept in isolated wards. Everything which comes from such a ward should be disinfected, and the immediate attendants of the sick should not be allowed to visit other parts of the hospital without first changing their outer clothing for a recently disinfected suit, and washing their hands in a disinfecting solution. When relieved from duty their underclothing should also be disinfected; and they should take a complete bath with one of the weak disinfecting solutions heretofore recommended.

Every hospital should be provided with a steam disinfecting apparatus, or with an oven for disinfection by dry heat.

Disinfection of Water and Articles of Food.—The disinfection of drinking water on a large scale, in reservoirs, wells, etc., is impracticable. But it is a very simple matter to disinfect water which is suspected of being contaminated with the germs of cholera, typhoid fever, or any other disease transmissable in this way. This is readily accomplished by boiling. As already stated, all known disease germs are destroyed by the boiling temperature maintained for half an hour. The importance of this precaution during the prevalence of an epidemic of cholera or of typhoid fever cannot be over-estimated, when the water used for drinking purposes comes from an impure source, or is liable to contamination by the discharges of patients suffering with these diseases. Those articles of food, and especially milk, animal broths, etc., which might serve as pabulum for disease germs, should, during the prevalence of an epidemic, be cooked but a short time before they are eaten. And such food, if put aside for some hours after it has been prepared, should always be again subjected to a boiling temperature shortly before it is served. Food which gives

Digitized by Google

evidence of commencing putrefaction is unfit for use, and in time of epidemics is especielly dangerous.

Disinfection of Ships.—It should be the aim of a physician attached to a passenger ship, or of the master of a vessel having no physician on board, to prevent the vessel from becoming infected when in an infected port, or when cases of infectious disease occur on board. This is to be accomplished by keeping the ship clean; by disinfecting suspected articles, and especially the soiled clothing of passengers, before they are received on board; by the isolation of cases of infectious disease which occur on board; and by the thorough execution of those measures of disinfection recommended for the sick room. When a case of cholera or yellow fever occurs upon a ship at sea, it cannot be taken as evidence that the vessel is infected unless at least five days have elapsed since the person attacked came on board. For he may have contracted the disease from exposure at the port of departure, or in some other locality on shore. When, however, a longer time than this has elapsed, or when several cases develop in a particular locality on shipboard, either simultaneously or successively, the vessel must be considered infected, unless it is shown that the cases are directly due to the opening of baggage containing infected clothing.

In practice, the sanitary officials at the port of arrival usually treat a vessel as infected if any cases of infectious diseases have occurred upon her during the voyage. This is a safe general rule, which should not be departed from unless a considerable time—five to seven days—has elapsed since the cases occurred, and they can be clearly traced to an exposure before coming on board. In this case, if the ship is clean and the precautions relating to disinfection and isolation of the sick have been faithfully executed, the health officer may be justified in dispensing with the general measures of disinfection which are required for an infected ship.

These measures do not differ from those heretofore recommended for the disinfection of the sick-room and its contents; but the special conditions on shipboard, and the great interest at stake, make it essential that the execution of these measures should be in the hands of sanitary experts.

In the disinfection of ships, fumigation with sulphurous acid gas is a measure of prime importance, and is largely practised by those in charge of quarantine establishments. The fact that the ship may be almost hermetically closed, and the escape of gas to a great extent prevented, makes this method of disinfection more trustworthy than in the case of dwellings and hospitals. The further fact that certain portions of the ship are inaccessible for the application of disinfecting solutions seems to make the use of a gaseous disinfectant imperative.

Disinfection by means of steam, especially of an iron vessel, would no doubt be a difficult matter on account of the condensation which would occur from contact with the cool walls of the vessel below the water line. But it will be well to fill the vessel with steam before introducing the sulphur dioxide; for, as already

Digitized by Google

stated, the disinfecting power of this agent is much greater in presence of moisture. A well equipped quarantine establishment should have an apparatus for generating sulphurous acid gas, and injecting it into vessels, as this is the most expeditious and satisfactory method of fumigating a ship. (1)

An essential part of the disinfection of a ship will consist in the thorough cleansing of the bilge. The international Sanitary Conference of Rome prescribes that the bilge water shall be pumped out and replaced by sea water at least twice at each disinfection of the vessel. This is very well so far as it goes, but we would also recommend that after such cleansing, the potent disinfectant, mercuric chloride, be added to the clean sea water remaining in the bilge in the proportion of 1 pound to the ton of water estimated. In the case of ships sailing from ports infected with yellow fever, it would be a wise precaution, after the cleansing of the bilge at the point of departure, to throw the same amount of mercuric chloride, dissolved in salt water, into the bilge, and to add a smaller quantity of the same solution at intervels during the voyage.

Merchandise.—Article V. of the report of the Committee on Disinfectants of the International Sanitary Conference of Rome, says:

"V. Disinfection of merchandise and of the mails is unnecessary. (Steam, under pressure, is the only reliable agent for the disinfection of rags—*les chiffons en gros*)."

We think this statement too broad, especially so far as merchandise is concerned which has been on board a ship infected with yellow fever. The poison of this disease seems to be capable of self-multiplication on a foul ship in tropical latitudes, quite independently of passengers and crew. And there is ample evidence that even when no case has occurred on an infected ship at sea those who are engaged in discharging her cargo after her arrival in port may be seized with yellow fever from breathing the infected atmosphere of the hold. Evidently merchandise conveyed on such a ship should be disinfected. But it does not seem necessary to break packages which have gone on board in good condition, and a thorough fumigation with sulphurous acid gas will be sufficient if the unbroken packages are so distributed as to be fairly exposed to the action of the disinfecting agent. To accomplish this, and to effectually disinfect the ship, it will be necessary to discharge the cargo at the quarantine station.

The collections of the ragman cannot be properly placed in the same category with other merchandise, such as agricultural products, hardware, new cotton or woolen goods, etc. An exception with regard to rags is indicated, but not stated with sufficient precision, in the article which we have quoted. There is evidence that small-pox has been not infrequently transmitted by rags,

(1). The New Orleans quarantine establishment is provided with an apparatus of this kind, which seems to be well adapted for the purpose. See paper by Dr. Joseph Holt, in the annual report of the A. P. H. A. for the year 1884.

Digitized by Google

and sanitarians are generally agreed that it would be very imprudent to admit rags collected in or shipped from localities infected with cholera or yellow fever, without first subjecting them to thorough disinfection. The only practical way of accomplishing this seems to be by means of super-heated steam. To make this effective, it will be necessary to open the bales and spread out the rags in such a manner that they may be freely exposed to the action of the disinfecting agent, or to inject the steam under pressure into the interior of the bales through perforated metal tubes, as is practiced at the New York quarantine station.

PART SECOND.

INDIVIDUAL PROPHYLAXIS AGAINST INFECTIOUS DISEASES.

The State establishes quarantine stations to guard against the introduction of infectious diseases of exotic origin; and in enlightened countries, sanitary officials, under the direction of the central government, or of States and municipalities, are charged with the duty of guarding the public against such diseases. It is generally recognized that this is to be accomplished by the isolation of the sick, the use of disinfectants, and by general measures of sanitary police.

One way in which the individual may indirectly protect himself against such diseases is by using his influence to have this sanitary service placed in the hands of competent men, and sustaining them in their efforts to exclude or stamp out infectious diseases by such measures as have been demonstrated by science and experience to be efficient for this purpose.

But this is not the kind of "individual prophylaxis" which we have to consider here. The question is, what can the individual do to protect himself and those immediately dependent upon him, under the various circumstances in which he may be placed, and especially in the presence of an epidemic?

As the advice we have to give will differ greatly according to the disease, we shall pass in review the principal infectious maladies of man, and shall attempt to give for each such practical instructions as will enable an intelligent person to take all practicable precautions for his own protection, and for that of his immediate family. We have first, however, to make some general remarks.

Infectious diseases are contracted by contact with the sick, through the medium of infected articles,—"fomites"—or by exposure in infected localities.

The evident general rule of prophylaxis is, therefore, to avoid all these sources of infection; but there are circumstances in which this is either impossible or unjustifiable. Duty calls the physician and the nurse into the sick room, and no argument based upon self-protection can keep the devoted mother from the bed side of her sick child, or the wife from giving her personal

Digitized by Google

attention to her husband, or the husband to his wife, when stricken by pestilence. Humanity requires that during an epidemic the sick shall be cared for, the dead buried, and the foul places cleansed. All this calls for the active and intelligent efforts of persons who have the courage to face danger, and not only of those who by their profession are necessarily brought in contact with the sick,—physicians, clergymen, sanitary officials, nurses,—but often, also, volunteers; for, during the prevalence of an epidemic of cholera, or of yellow fever, the number of physicians and trained nurses within the infected area is commonly insufficient for the care of the sick. The history of epidemics shows that brave men and women are to be found in every civilized country, who are willing to volunteer for such perilous duties; and also the physicians, and those whose legitimate duty is to care for the sick, very rarely desert their post in time of danger; but the mortality among these brave men and women who stand by their guns, and among the volunteers who go to their assistance, is often very great. There is a wide-spread notion among people not familiar with the facts, that doctors enjoy a certain immunity from infectious diseases not possessed by other people, and that the absence of fear is a safeguard against infection. Such a supposition is without foundation, and is an insult to the brave men and women who fall at their post of duty in every epidemic. Courage is no more a protection against disease germs than against bullets. It is true, that in epidemics, as in war, the skulkers and cowards often run into danger which the men in the ranks escape. The rashness which results from ignorance or from thoughtlessness is not courage, any more than the prodence which avoids danger when there is no good reason for facing it is cowardice. Those who rashly venture within the lines drawn by an epidemic, in the pursuit of business or pleasure, on the supposition that they will escape the prevailing disease because they are "not afraid," often fall victims to their unreasoning temerity, and not infrequently beat a hasty retreat, with blanched face, when they are brought directly into the presence of the sick and dying.

Our advice to the brave is, do not put your trust in courage, for it is no armor against infection. Rely rather upon those precautions which science and experience indicate as best suited to the special circumstances in which you may be placed, and do not hesitate to retreat before an invisible foe, when you are not required by considerations of duty to remain upon the field of battle. If your services are not required, you are simply in the way; and if you fall ill, you add to the labors of those who devote themselves to the care of the sick. And to the timid we would say, let not your fear control your actions, but look the circumstances squarely in the face, and be guided by reason and knowledge, or by the advice of those competent to decide for you. A premature flight may bring you into ridicule, or into greater dangers than those you flee from. Do not let your fears ex-

Digitized by Google

aggerate the facts, and weigh these in the balance of your reason, and not of your apprehension. The fact that Judge A. or Colonel B. has fallen a victim to cholera or yellow fever is no more a reason for deserting your home, than is the fact that the humblest citizen of your town has died from the same disease.

If courage is no protection against infection, it cannot be denied that fear in the presence of the infectious agent, is a predisposing cause which frequently determines an attack, and which may turn the balance in favor of a fatal result. The depressing effect of fear is well known, and all influences which reduce the vital resisting power of the individual predisposed to an attack when an epidemic is prevailing.

Other predisposing causes of a general nature are those conditions of an enfeebled resistance which result from ill-health, venereal and bacchanalian excesses, etc.

Of all these, it is probable that excessive indulgence in intoxicating drinks is the most potent factor in swelling the mortality returns during the prevalence of pestilential disease. This predisposing cause acts in several different ways. The individual whose reason is befuddled by drink, stumbles stupidly into all kinds of danger. He is "not afraid" to sleep upon the ground, exposed to the night air, when yellow fever is prevaling or to quench his thirst with water which a prudent man would reject as unfit to drink in the presence of cholera, or to wrap himself in a blanket which recently had been in use by a patient with small-pox. Again: the debility often attended with digestive derangement, which follows a recent debauch, constitutes a most favorable condition for the reception of the germs of cholera, of yellow fever, and of infectious diseases generally. Those who use intoxicating drinks habitually, but within the limits marked by that mental aberration or loss of reason which constitutes intoxication, are less subject to infection than the man who is suffering from the effects of a recent "spree." But if they have any organic disease of the stomach, the kidneys, or the liver, as a result of their habits, this constitutes a predisposition to be attacked, and is a very serious complication when an attack is developed.

Persons suffering from chronic wasting diseases, profuse discharges, or recent hemorrhage, are especially liable to become the victims of an infectious disease during its epidemic prevalence. The same is true of those whose vital resistance is below par from insufficient food, or from the continued respiration of vitiated air, crowd poisoning, sewer-gas poisoning, etc.

In addition to these predisposing causes pentioned, which furnish indications of more or less value with reference to individual prophylaxis, there are individual and race differences in susceptibility to certain diseases manifested by those who are in perfect health. One man may be repeatedly exposed to an infectious disease without falling sick, while another may suffer several attacks of a disease, such as small-pox, in which one attack commonly confers immunity. Race differences in susceptibility are

Digitized by Google

shown in the relative immunity of the negro from the effects of the yellow fever poison, and the great susceptibility of the same race to small-pox.

We shall now consider in detail the question of individual prophylaxis against certain infectious diseases, which, by reason of their fatality and occasional wide-spread epidemic prevalence, seem entitled to special attention in an esssay of this nature.

Cholera.—In Asiatic cholera the danger of infection from association with the sick, in the capacity of nurse or physician, is very slight. This is amply demonstrated by experience. On the other hand, laundresses who do not come directly in contact with the sick, but who handle clothing soiled by their discharges, are liable to contract the disease. By far the greater number of cases, however, result from exposure in infected localities, and from drinking infected water. Outside of the area in India, where cholera prevails as an epidemic disease, localities become infected and the water supply contaminated as a result of the introduction of infectious material from previously infected localities, either in fomites, or through the medium of the discharges of the sick. These facts furnish the indications for individual as well as for general measures of prophylaxis.

In the sick-room the precautions to be taken are, to keep the room clean and well ventilated, to disinfect the discharges of the sick and all soiled articles as promptly as possible, and to wash the hands in a disinfecting solution when they have been in contact with the patient or with soiled clothing. Attendants should not take their food in the room occupied by the sick, and should not drink liquids which have been exposed in the sick room.

The general directions relating to diet, drinking-water, etc., which we shall shortly give, apply to the attendants upon the sick as well as to those at distance from them; and it should be remembered, in the interest of the sick, that these attendants do not run any special risk beyond those to which all persons within the area of infection are exposed. Indeed, we may go further, and say that they run far less risk when they are in a well regulated hospital and under intelligent supervision, than to those persons who dwell in the localities outside of the hospital from which the cases under their charge have come.

Attendants upon the sick should have their meals at regular hours should not be deprived of a fair allowance of sleep, and should never be allowed to become exhausted by protracted vigils or excessive fatigue.

When cholera has been introduced into a country and is extending its limits from day to day, one of the first questions which will present itself to those who are to change their places of residence will be whether they shall attempt to keep out of its way, and if so, where it is best to go. The answer to this question must depend very much upon circumstances. Those who are unfortunate enough to live in a city or town which has a bad sanitary record, which is not provided with an efficient health department, or does

Digitized by Google

not provide money to enable the officers appointed to do efficient work, had better decamp in good time so as to evade the foe entirely, or to meet it upon a field more favorable for defensive operations. There should be no stampede and no running away in haste, without any definite idea of why and where. The time to go is before the disease has fairly obtained a lodgment. Consider that if the season is not far advanced, and the town is in an unfavorable sanitary condition, there is every reason to anticipate that the first cases will be followed by a severe epidemic, and decide at the outset whether you will put your castle in order to stand a siege, trusting to well considered measures of individual prophylaxis, or whether you will beat a masterly retreat in advance of the first assaults of the enemy. Those who vacillate in the hope one day that the epidemic is on the decline, and in the fear the next that it will sweep everything before it, in the end very often stay, when they could just as well have gone, and at the same time neglect those precautions which they should have taken at the outset if they had decided to stay.

To those who are unable or unwilling to desert their homes, we would say, that when proper precautions are taken, the danger is really not very great, and that sanitaries look for the day when cholera will practically be banished from civilized countries. See that your premises are in good sanitary condition, and do what you can to induce your neighbors and the authorities in your town to prepare for the storm. Lood especially after the plumbing of your houses, and if there is a cesspool or privy vault upon your premises see that it is kept in good condition by the use of antiseptics and deodorants. (1). Above all, be sure that no food comes into your house except such as is sound and good, and the drinking water used by your family is beyond suspicion. Well water is always open to suspicion and in general, during the prevalence of cholera, it will be advisable to *boil all water used for drinking purposes.* This is a prophylactic measure of prime importance, and there is good reason to believe that if faithfully executed it would to a great extent limit the ravages of the Asiatic pestilence. Tea and coffee recently made can be taken with impunity. Milk during the prevalence of an epidemic, should be boiled before it is used as food. Mineral waters, if bottled at places distant from the infected area, may be drunk in moderation. A moderate amount of sound wine, which was bottled prior to the epidemic, may be permitted to those who are in the habit of using it. Those not in the habit of using stimulants should not resort to their use during the progress of an epidemic. Those accustomed to them should restrict their libations within moderate limits, and will find a little brandy and soda, or appolinaris water, to be better than wine, and especially than the acid wines, which are apt to derange the digestion.

(1). See Part 1st of this essay for details relating to the use of these agents.

Digitized by Google

Food should be plain and well cooked, and should be taken in moderate quantities. Intemperance in eating is quite as bad as intemperance in drinking. Soups, meat, and vegetables should always be served hot, and should not be put aside for a future repast, or if served a second time should be brought to the temperature of boiling water shortly before they are eaten. Pastry and rich puddings, and all coarse and indigestible meats and vegetables, are to be avoided. Sound, ripe fruit, which has been brought to the house with the outer skin unbroken, may be eaten in moderation by those who know by experience that it agrees with them. It should be carefully washed before it is eaten. Melons, cucumbers, unripe apples, peaches or pears, acid fruits generally, and, in short, all these artic'es which are known to give rise to digestive derangements in the absence of cholera would be better banished from the supply list during the prevalence of this disease.

Next to the precautions relating to food and drink we would place those relating to personal habits and clothing. The bowels should not be allowed to become constipated, and, on the other hand, any tendency to diarrhœa should at once receive attention. This is a matter of the greatest importance, and, indeed, is second to none other in individual prophylaxis. Absolute rest, a light diet and a dose or two of chlorodyne, or of Hope's mixture, or of any approved combination of any opiate and an astringent will usually suffice to control a slight diarrhœa, even if it is of a choleraic character.

The clothing should be suited to the season, but great care must be taken that it is warm enough at all times to prevent the body from becoming chilled. A broad flannel belt worn about the abdomen is recommended by some physicians of experience, and may be useful. Baths should be taken at frequent intervals, but should not be too prolonged or too cold, and should be followed by a vigorous rubbing of the surface to establish reaction. Excessive exercise and fatiguing labor of all kinds are to be avoided. One should never feel "done up" as a result of his exertions in the way of business or of pleasure, for the lassitude resulting from overexertion, like that which results from fear, predisposes to an attack. Mental depression is, so far as possible, to be avoided; grief, despondency and "carking care" are recognized as predisposing causes in cholera and other infectious diseases.

The use of "sulphuric acid lemonade"—that is, of pure water acidulated with this acid and sweetened to taste—has been recommended as a prophylactic, and there is some evidence in favor of its usefulness. We would not advise its indiscriminate use, or that of any other prophylactic of this nature. When cholera has made its appearance in a dwelling or in a public institute the inmates may be given this to the exclusion of all other drinks.

Yellow Fever.—This disease, like cholera, is contracted in infected localities rather than by contact with the sick. Indeed, it is rarely, if ever, communicated directly by a sick person to his

Digitized by Google

attendants. In infected places the poison seems to be given off from the soil, or from collections of decomposing organic matter, but we have no definite evidence that it is communicated from eating food or drinking water. The history of epidemics of this disease shows that when it obtains a lodgment in a city or town which is in an insanitary condition, in southern latitudes and during the summer months, it extends its area and invades new localities similarly situated, until frost occurs, or at least until the weather becomes comparatively cool in the autumn. Those who remain in an infected area, unless protected by a previous attack, are almost certain to contract the disease, and much less can be done in the way of individual prophylaxis than in cholera. We therefore advise all those who can get out of the way of this fatal disease to do so. As a rule, there will be plenty of time, after there is evidence that the disease has established itself in certain parts of the city, for those who live at a little distance from these centres of infection to get away in a deliberate and well-considered manner. The occurrence of one or more imported cases cannot be taken as evidence that an epidemic will follow, and is no reason for deserting one's home. If proper precautions are taken by the sanitary authorities it is very probable that no evil result will follow such importation of the disease. But when these imported cases are followed by the occurrence of other cases in the vicinity where they have been sick, or when such local cases occur in the vicinity of the wharves where vessels from infected ports discharge their cargoes, or in sailor's boarding-houses, etc., it must be taken as evidence that the disease has effected a lodgment, and that infected centres have been established from which an epidemic will in all probability be developed, if the season is favorable and the city is in an insanitary condition.

An epidemic is not developed so rapidly as in the case of cholera, but the disease usually extends its limits in a very deliberate way, and while it is claiming its victims in one section of the city, other sections in the immediate vicinity may be quite healthy. But the territory invaded remains infected until cold weather puts an end to the epidemic. Frequently it happens that no new cases occur in an infected area for several weeks, or even months, for the simple reason that all those who remain to do battle with the pestilence have suffered an attack or are protected by previous attacks. The epidemic has ceased for want of material, but the infection remains and will manifest itself if unprotected persons venture within the infected area from a mistaken idea that there is no more danger because there are no longer any cases.

In this disease, then, the most important point in individual prophylaxis is to keep away from infected localities, and from those places where the disease is epidemic,—e. g, Havana, Vera Cruz, Rio Janerio,—during the season of its prevalence. Very many lives have been sacrificed by misplaced confidence in the protection courage is supposed to afford against this disease. "I

Digitized by Google

am not afraid," says the merchant whose business calls him to an infected city, or the sea-captain who wishes to obtain a cargo of sugar in Havana during the summer months. But not being afraid does not prevent such persons from being attacked, and the mortality at Havana among sailors from northern latitudes is very great. There is a tendency in places where the disease is endemic to underrate its malignity, and to ascribe every fatal case to some fault on the part of the unfortunate victim or his attendants. He was "frightened to death," or "was not properly nursed," or he was "imprudent," etc., etc. The mortality is no doubt largely influenced by these secondary causes, but yellow fever is a malignant disease, which under the most favorable circumstances is very fatal to unacclimated strangers within the limits of its endemic prevalence, and which in its epidemic extension in new territory claims from thirty to fifty per cent., or even more, of those who fall sick, as its victims. This being the case, we repeat our advice to all those whose duty does not require them to stay on the field of battle, to make an orderly retreat to some place of safety.

The precautions relating to food and to personal habits do not differ materially from those recommended in the case of cholera. The diet should be simple, and excesses should be avoided. Less care will be necessary with reference to the use of fruits and vegetables; indeed they are rather to be recommended, as better suited than animal food to the warm latitude in which this disease prevails. Constipation should, above all things, be avoided; and if there is evidence that the functions of the liver or kidneys are imperfectly performed, suitable medication should be resorted to.

There is no especial danger from the use of water, if it is from a source which insures it from contamination with organic impurities. Spirituous liquors, if used at all, should be taken in great moderation. Nothing is more likely to develop an attack than alcoholic excesses, and the habitual drunkard is almost doomed to death if he falls sick with this disease. Exposure to the direct rays of the sun, excessive fatigue, and venereal excessess, are all predisposing causes, which it is within the province of individual prophylaxis to avoid. Exposure to the night air, and especially sleeping out of doors near the ground, is recognized by physicians in yellow fever regions as an invitation to an attack. Great care should be taken to avoid chilling of the body, and it is well to sleep as far from the ground as possible. The creoles of Louisiana and of the West Indies generally insist upon closing the windows of a sleeping room at night.

The mortality among the natives of tropical climates, and especially among those whose habits are good, and who are accustomed to a frugal mode of life, is very much less than among the natives of northern latitudes, when these come without any previous "acclimation," within the influence of the yellow fever poison. Those who are habituated to life in the extreme south

Digitized by Google

enjoy a certain immunity from the effects of this poison, which is shown by a lower death-rate rather than by any exemption from being attacked. One attack of this disease as a rule, confers immunity from a subsequent attack.

Individual prophylaxis in an infected city will include the avoidance of those localities which give special evidence of being infected, and especial care not to visit such places at night.

The liberal use of disinfectants in cesspools and water closets, and a perfect state of sanitary police in and around the premises, will constitute a most important part of the precautionary measures which every individual should take for his own protection and that of his family. A state of mental equilibrium, an intelligent understanding of the special circumstances in which he is placed, and of the various measures of prophylaxis heretofore indicated will enable an individual to look the facts squarely in the face, and to be governed by the light of reason and science. Unfortunately it often happens, among the ignorant and degraded that a spirit of bravado, attended with the neglect of the simplest sanitary precaution, and a disposition to deny the presence of the dreaded foe, prevails during the earlier stages of an epidemic, and that this is followed by a disorderly stampede and a disgraceful neglect of the sick, when the presence and malignant nature of the pestilence are recognized.

Small-Pox.—This disease is contracted by exposure to emanations from the body of the sick, or from articles which have been in use by them or exposed in their vicinity. There is no evidence that the small-pox poison multiplies external to the human body, and the indications for prophylaxis are therefore quite different from those already given for cholera and yellow fever. One may eat what he pleases, and wallow in filth, when small-pox is prevailing without contracting the disease, so long as he keeps away from the sick, and is not brought in contact with any article infected by them. In this disease, however, as in the infectious diseases generally, previous personal habits will greatly influence the result when exposure does occur; and the disease is more fatal to the victims of alcoholism, to those who are poorly nourished, and, in general, to those whose vitality is reduced by exposure to noxious effluvia from putrefying organic material, by living in overcrowded and ill-ventilated apartments, etc.

As it is now universally practiced to isolate small-pox patients as soon as the disease is recognized the danger of coming, accidentally, in contact with them is not great. There is but little danger of infection from passing within a few yards of a patient with small-pox in the open air, or from passing a building in which patients are under treatment. Unprotected persons who enter the sick-room are, however, extremely liable to contract the disease; and the infectious material given off from the patient's body clings most tenaciously to surfaces, to clothing, etc., and may give rise to an attack after many months, unless destroyed by disinfection.

Digitized by Google

It is evident, then, that individual prophylaxis will include the avoidance of places which have been occupied by the sick, and of articles used by them, unless there is a certainty that they have been thoroughly disinfected. It is probable that an unprotected person, who feels obliged, for special reasons, to enter the sick-room, may escape infection by the use of an air filter placed over the mouth and nostrils. This should be constructed on the principle of the "Tyndal respirator," in which all inspired air is made to pass through a layer of cotton wadding, which arrests suspended particles. It would be necessary immediately on coming out of the room to burn the cotton filter, to bathe the hands and face in a disinfecting solution, and to change the outer clothing.

It is a general rule in regard to infectious diseases that those who are necessarily exposed to them should take the precaution of not going into the sick-room with an "empty stomach," or in a condition of exhaustion from any cause. A cup of coffee or a glass of wine and a cracker, may be taken if a considerable interval has elapsed since the last regular meal.

It is well known that against small-pox we have a special measure of prophylaxis, which has restricted the ravages of this disease within the limits which are left to it by carelessness in regard to the application of this measure, or ignorance of its value. Since the famous discovery by Jenner, vaccination has become the prophylactic *par excellence*.

The immunity conferred by vaccination is, as a rule, complete; but there are exceptions to this rule, and vaccinated persons occasionally suffer from a modified form of this disease. The statistics of the London small-pox hospital show that the mortality among unvaccinated persons received into that hospital with small-pox, is 35.55 per cent.; while the mortality among vaccinated persons is less than 7 per cent. No doubt a large portion of the cases of post-vaccinal small-pox might have been prevented by revaccination.

It is now recognized that the protective influence of vaccination is not always of a permanent character, and children who have been successfully vaccinated in infancy should be revaccinated when they reach the age of puberty, or sooner, if small-pox is prevailing in the neighborhood. The operation is so trifling that it is customary to vaccinate old and young, with the exception of those who have been successfully vaccinated within a year or two, whenever an outbreak of small-pox occurs. This practice is to be recommended, but when the operation has been performed in a proper manner, with virus which is known to be reliable, it is folly to insist upon a frequent repetition of the vaccination, because "it didn't take." If the first vaccination has been completely successful, a *perfect* result from revaccination is not usually obtained; and the fact that no result is obtained must be taken as evidence that the person is protected.

The prophylactic value of vaccination practised after exposure to small-pox has been demonstrated, and one who is not entirely

Digitized by Google

certain that he is protected by recent successful vaccination will do well to resort to this important prophylactic measure at once, if he has reason to suspect that he has been exposed to small-pox.

Scarlet Fever.—In this disease, as in small pox, the poison is given off from the bodies of the sick, and is not reproduced independently of them. As we have no knowledge of any means of protection corresponding with vaccination, prophylaxis consists solely in keeping out of the reach of inefction by the sick, or by articles infected by them.

The sick person may communicate the disease during the whole period of his illness and convalescence—a period which often extends to five or six weeks, or even longer than this. Infected clothing, which has been packed away for months, may communicate the disease; and there are numerous instances on record of its transmission to children at a distance from the sick, by healthy persons who have recently come in contact with scarlet fever patients. The lower animals, and especially pet cats and dogs which may have visited the sick-room unnoticed, or which are thoughtlessly given to convalescent children for their amusement, constitute a great source of danger. Persons who have suffered an attack of the disease, or who have but little susceptibility to it, may have a slight sore throat as a result of exposure to the scarlet fever poison, and may communicate the disease in its more severe form to unprotected children. One great difficulty in arresting the progress of an epidemic by isolation of the sick and disinfection results from the fact that these slight and often unrecognized cases are frequently allowed full liberty.

Infection has been traced to milk which has been standing in the sick room, or to the same liquid which had become infected at a dairy where scarlet fever had prevailed and where recent convalescents were permitted to milk the cows.

All of these facts point to a most rigid exclusion of susceptible children from every possible source of infection. The susceptibility of adults is very much less, and, when attacked, they usually have the disease in a mild form. But their responsibility extends far beyond the point of avoiding the sick for their own protection. Those who are associated with susceptible children have no right under any circumstances to visit the room of the scarlet fever patient without taking the most thorough precautions with regard to the disinfection of their person and clothing immediately upon leaving it; and even with these precautions such a visit cannot be justified when it is made simply out of curiocity or friendship. Only those who are in attendance upon the sick should be allowed in the sick-room, and they must be regarded as infected persons, who are not to be permitted to come in contact with unprotected children while they are engaged in this duty.

Diphtheria.—This is a disease in which the infectious material is given off from the surface affected, and probably not from the general surface of the body. As the usual seat of the disease is the throat and the nasal mucous membrane, it is the discharges

Digitized by Google

from these surfaces which are specially dangerous. Although adults are much less susceptible to the disease than children, there have been numrous instances in which they have contracted diphtheria by the accidental reception of a bit of infectious material directly into the fauces. This is especially liable to occur during the operation of tracheotomy; and several physicians have lost their lives in this way in their efforts to save those of their patients by aspirating through the tracheotomy tube. It seems extremely probable that the diphtheretic poison germ is capable of increase, independently of the sick, in damp, foul places, such as sewers, damp cellars, and especially under old houses in which the floors come near the surface of the ground, leaving a damp, ill-ventilated space. At all events, the disease often clings to such houses in spite of the application of the usual means of disinfection. There is no doubt as to the influence of bad hygienic conditions in maintaining the infection when the disease has been introduced, and it is possible that such conditions may, in certain cases, originate it.

Insufficient nourishment, the malarial poison and insanitary surroundings are predisposing causes to the disease. Those suffering from scarlet fever, measles and tuberculosis are also specially liable to be attacked. As in the case of scarlet fever, mild cases, which in the absence of others more pronounced it would be difficult to recognize, is due to the diphtheretic poison, may give rise to malignant diphtheria in more susceptible individuals, or in those whose vital resisting power is reduced by any of the causes mentioned.

Prophylaxis will demand complete non-intercourse with the sick, avoidance of infected localities, and care to exclude all persons and articles from such houses from contact with yourself or children. The disease is often spread by thoughtless persons who visit the sick-room and even kiss the infected patients, and then, without any precautions in the way of disinfection, fondle healthy children in other places, and perhaps transmit by a kiss the infectious material which has adhered to their lips. The possibility of transmission by pet animals is also to be borne in mind.

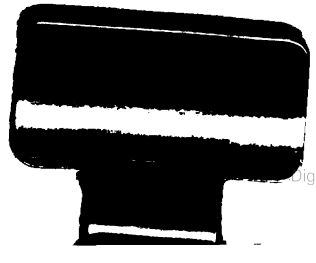
Tuberculosis.—Recent researches have demonstrated that tubercular consumption is an infectious disease, and that the sputa of those affected with it, injected into susceptible animals, reproduces in them the same disease. This sputim is therefore infectious material, and should be destroyed by burning, or by the use of chemical disinfectants. There would be little danger of infection from the moist masses of sputim, but in a dessicated condition this material is liable to reach the lungs of susceptible individuals and to induce the disease.

It is well known that there is a great difference in susceptibility to pulmonary consumption, and that in certain families this disease carries off one member after another, while it is unknown in other families. Those who have this hereditary disposition should pay especial attention to individual prophylaxis. They should avoid intimate association with consumptive persons,

Digitized by Google

INDEX.

	Page.
Members of the Board	2
Secretary's Report	3-7
Financial Statement	8-12
Transactions of Board in Session	13-22
List of Graduates	23-37
List of Ten Year Practitioners	38-45
List of Examined	46-48
Local Boards of Health	49-57
Reports of Local Health Officers	58-64
Decision of the Court of Appeals	65-69
Report on Wheeling Water Supply	70-76
Paper of Dr. Garrison	73-76
Report on Penitentiary	77-78
Report on Hospital for the Insane	79-80
Vital Statistics	81-100
Hog Cholera or Swine Plague (Dr. Harris)	101-106
Dry-Earth Closet	107-109
The Study of Hygiene in Schools	110-114
Disinfection and Personal Prophylaxis	115-152



Digitized by Google

Digitized by Google